

Boring L							ledy/Jenks Consultants							
BORING LOCATION A rea 1	, Build	ing 41			I	Boring Name ——	2BB-1-6							
DRILLING COMPA	NY		•	DRILLER Gary W		Project Name	Douglas Aircraft							
Water DRILLING METHO	DEVEIO DD (S)	pinen.		DRILL BIT (S) SIZ		-	974002.00							
DEPTH TO WATER			em Auger	8 inche	EL EL	Project Number	TOTAL DEPTH							
Not E1	counte	red			DA	Not Surveye TE STARTED	DATE COMPLETED							
D. Sch	neeber	ger		<u> </u>		4/17/97	4/17/97							
Percentage Collected Seconstrate Collected Secons Collected Secons Collected Secons Sec	Head Space Reading (ppm)	Depth (feet)	Lithology	JSCS Munsell Log Color		DESCRIPTION AND	DRILLING REMARKS							
3 2 4	18.7	1 1 1.	CI	5YR 3/2	Asphalt, 4" Sandy CLAY: dark reddi	sh brown, soft, moist, i	moderately plastic, medium to fine sand -							
3 3 9 -	27.0	5-			medium stiff; very moist									
3 4 10	18.7	10- -	М	L	Clayey SILT: reddish bro	own, medium stiff, moi	ist. moderately to slightly plastic							
3 4 10	177	15- - - 20-												
		25-												
3 5 11	239	30- - - - 35-	c	2.5YR 4/4	Silty CLAY: reddish bro	wn, stiff, moist, slightl	y plastic, trace of fine sand							
3 5 12	231	40- 40-	M	SYR 4/4	Clayey SILT: reddish bro	own, stiff, damp, mode	erately to slightly plastic, trace of fine sand							

		ŀ	Boring Name 2BB-1-6							
	DRILLER	. ,								
	Gary W	hitley	Project Name	=						
em Auger			Project Number							
			ELEVATION Not Surveyed	TOTAL DEPTH	ent					
			DATE STARTED	DATE COMPLETED						
			4/17/97	4/17/9	97					
Lithology										
MI	5YR 4/4	Clayey SILT (continue	d): reddish brown, stiff, d	amp. moderately to slightly plastic, tr	ace of					
SP	2.5Y 5/6	SAND: light olive bro	nt olive brown, medium dense, damp, fine, trace of sift							
		-								
	Lithology M	em Auger DRILL BIT (S) SIZE 8 inches Lithology USCS Munsell Color	Cary Whitley DRILL BIT (S) SIZE 8 inches SOI Lithology USCS Log Munsell Color Color Color SOI ML 5YR 4/4 Clayey SILT (continue fine sand	DRILLER Gary Whitley Project Name DRILL BIT (S) SIZE Project Number ELEVATION Not Surveyed DATE STARTED 4/17/97 Lithology USCS Log Munsell Color SOIL DESCRIPTION AND I fine sand	DRILLER Gary Whitley Project Name Project Number Project Num					

			_og							nedy/Jenks Consultants
		ocati A rea	1. Chen	uical E	Itching Area				Boring Name	2BB-1-23
DRILL		COMP Water	any r Develo	pmen	t		DRILLER Gary W	hitley	Project Name	Douglas Aircraft
DRILL	ING	METH	OD(S)		tem Auger		DRILL BIT (S) SIZE 8 inches	,	Project Number =	974002.00
DEPTI	1 TO	WATE	R		· · · · · · · · · · · · · · · · · · ·			/// i	ELEVATION Not Surveye	TOTAL DEPTH
LOGG	ED I	BY	ncount						DATE STARTED	DATE COMPLETED
		D. Sci	neeber	ger	<u> </u>		1		4/18/97	4/18/97
Driven Recovered	Coffected	Penetration Resistance (boves/tool)	Head Space Reading (ppm)	Depth (feet)	Lithology	USCS Log	Munsell Color	SOl	L DESCRIPTION AND	DRILLING REMARKS
	***	2 7 9	2.0	-		CL	2.5YR N2.5/1	Silty CLAY: reddish b	lack, medium stiff to stiff	ff. moist, moderately plastic
- - -		8 5 9		5 -		CL	2.5YR N2.5/1	CLAY: reddish black,	medium stiff, very moist,	t, moderately to very plastic
- - -		4 5 7	14.5	10- - - -		ML	7.5YR 4/4	Clayey SILT: brown, r	nedium stiff, moist, sligh	htly plastic
-	×	3 3 6	14.5	15- - - 20-		ML	2.5YR 4/4	Clayey SILT: reddish l	orown, soft, moist, slightl	tly plastic, trace of fine sand
				25- - -						
-	***	12 8 16	27	30-		CL .	2.5YR 4/4	Silty CLAY: reddish b	rown, very stiff, damp, sl	slightly to moderately plastic, trace of fine sand
				35-				-		
- -	***	3 5 8	52	40-		SC	7.5YR 4/4	Clayey Fine SAND: b	rown, medium dense, mo	oist. slightly plactic

DRI DRI DEP	TH T	NG NG TO	COMP. Water METH	<mark>1, Chen</mark> ANY Devek		Etching Area	- Ir			Boring Name	2BB-	1-23	
DEP LOC	TH	NG TO	Water METH	Develo			40			· · ·			
DEP LOC	тн	NG TO	METH		<u> pmen</u>	t		ORILLER Gary W	hitley	Project Name	Doug	las Aircraft	
		TO	CMF-	OD (S) - 85 . Hal		tem Auger	C	ORILL BIT (S) SIZE 8 inches		Project Number =	97400	2.00	
	GGE		WATE	R ncount					· · · · · · · · · · · · · · · · · · ·	ELEVATION Not Surveye		TOTAL DEPTH	50.5 feet
Jriven	<u> </u>	DΒ	Y				·-			DATE STARTED	-	DATE COMPLETED	
orken	ğΙ	I SA	D. Sci	ıneeber			ī —			4/18/97			4/18/97
5	ξl	Decled	andion serios serios	d Space	Depth (feet)	Lithology	USCS Log	Munsell Color	SO	IL DESCRIPTION AND	DRILLING	G REMARKS	i
-	ě	3	22.5	126			ML	7.5YR 4/4	Clayey Fine SAND (c	ontinued): brown, mediui	n dense, m	oist, slightly plastic	
	Reco-	SSS Cohec	4 12 17	35.4	45- 50- 55- 70-		ML	7.5YR 4/4	Clayey Fine SAND (c	ontinued): brown, mediui	m dense, m	oist, slightly plastic	
													-
					-								-
					80-				-				•
┡║					-				-				•
					-								

Boring BORING LOCAL			_					TCIII		enks Consultants
	olemen	tal A	rea	Northeast		DRILLER		Boring Name ——		SA-NE-2
Wat	er Dev	clopn	nent	<u>t</u>		Gary W	hitley	Project Name	Doug	las Aircraft
DRILLING MET	E-85, I	lollov	v St	em Auger		DRILL BIT (S) SIZE 8 inches		Project Number =	97400	
DEPTH TO WAT	er Encou	ntere	d					ELEVATION Not Surveye	ed	TOTAL DEPTH 50.5 feet
LOGGED BY	chneck							DATE STARTED 4/16/97		DATE COMPLETED 4/16/97
SAMPLE		7			USCS	Munsell	co.		15041-1-05/	
Driven Recove Collecte Prestration	Head Sp.	(fi	epth ret)	Lithology	USCS Log	Color		I. DESCRIPTION AND	DKILLING	J REMARKS
5 17 15	22.9		1		ML	2.5Y 3/2	Asphalt, 3" Clayey SILT: very dar	k grayish brown, very sti	ff, moist, sl	ightly plastic
2 5 12	31.2	2	5		CL	2.5Y 3/2	Sifty CLAY: very dark	grayish brown, stiff, mo	sist, modera	tely plastic
2 6 6 13	56.2	2	10- - -		CL.	2.5Y 3/3	Sandy CLAY; dark oliv	e brown, stiff, damp, slig	ghtly to mod	derately plastic, fine to medium sand
4 4 4	81.2		15-		SP	2.5Y 5/4	SAND: light olive bro	 wn. medium dense, damp	 p, fine, trace	e of silt
4 6 8	64.5		330-		CL	10YR 5/3	Sandy CLAY; brown,	nedium stiff, moist. mod	 derately plas	stic, fine sand
4 5 9	52.0		10-		SC	2.5Y 5/3	Clayey Fine SAND: li	ght ofive brown, medium		

	BORING LOCATION Supplemental Area Northeast DRILLING COMPANY Water Development DRILLING METHOD (S) DRILL BIT (S) SIZE									Boring Name	2BB-SA	-NE-2						
DRI	LLIN	G CO	MPA	NY				Gary W	'hitley	Project Name		s Aircraft						
DRI	LIN	G ME	THO	D(S)	low St	em Auger	D	RILL BIT (S) SIZE 8 inches			974002.	.00						
DEF	тн т	O WA	TER	counte						Project Number ELEVATION Not Surveyed	TC	DTAL DEPTH 50.5 feet						
LOC	GED	BY		neeber						Not Surveyed Date Started 4/16/97	D.	ATE COMPLETED 4/16/97						
	₹T.	AMPL	.ES	теерег														
u Ayeu	Covers	Persetrator	Own/hod)	Head Space Reading (Dpm)	Depth (feet)	Lithology	USCS Log	Musell Color	SO	IL DESCRIPTION AND I	DRILLING R	EMARKS						
-			55		457		SC	2.5¥ 5/3	SAND: light yellowish brown, dense, moist, fine, trace of clay									
▩	▓	X 1 X 1	8	35.4	50-		SP	2.5Y 6/3	SAND: light yellowis	h brown, dense, moist, fine	e, trace of cla							
					55-				Boring terminated at 2	- - - -								
-					60- -													
					65-							· · · · · · · · · · · · · · · · · · ·						
-					70- 75-							• •						
					80-													

			ig L						Rennedy/Jenks Consultants						
В	ORIN		OCATIO Batera		ldings 29 and 33				Boring Name —	15					
D	RILLI	ING	COMPA	NY		·	DRILLER		_						
1	RIIJJ	NG	Manes METHO	S D(S)			DRILL BIT	ete (S) SIZE	Project Name	DAC C-6 Parcel A Phase II					
L		(Geopre	obe				in.	Project Number -	954019.01					
ľ	EPIH		WATER Not En		ered				ELEVATION	TOTAL DEPTH 26 ft.					
L	OGGE	D E	BY						DATE STARTED	DATE COMPLETED					
E	_SA	MPI.	J. Knig Ex	4				·-	4/1/96	4/1/96					
	Recovered	ollected	Spars Spars (mg/l,	Depth (feet)	Lithelogy	USCS Log	Manuell Color	SOI	L DESCRIPTION AND	DRILLING REMARKS					
ľ		•	INES		SHAWAY			Concrete, 4"		-W-1-1-1					
8000000		***	5.7	5*		CL		Silty CLAY: dark brown, mo	oist, some very fine sand						
20000000		***	6.0	10- -		ML	- - :	Sandy SILT: brown, very fin	n, very fine sand, some clay, moist						
***************************************		**	5.4	15-		ML		very fine to fine sand, no cla	y						
		***	6.2	20-		CL		Silty CLAY: dark brown, mo	ist, micaceous						
		**	6.4	25-		ML		Sandy SILT: light brown, ver	y fine sand, moist						
				1				Boring Completed at 26 fee	£.	-					
ŧ				30-			-								
ŀ				35-			 - -								
				40-			-								
				-			-			-					

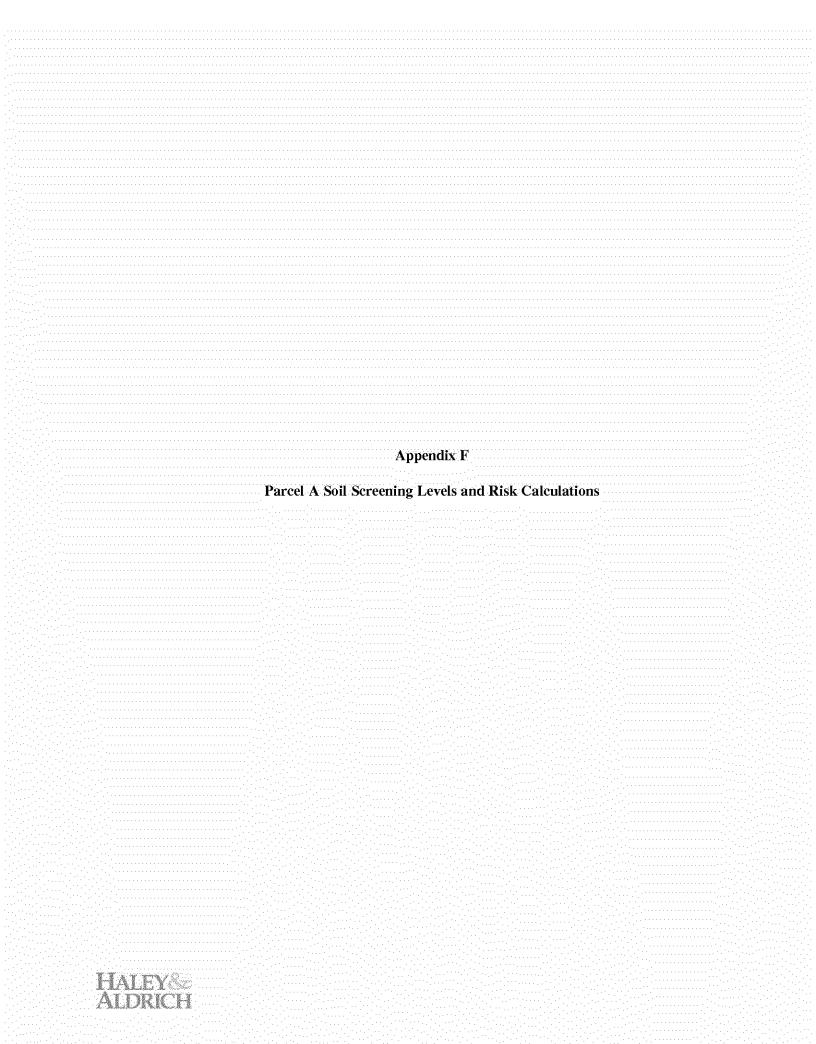




Table B-1. Site-specific Geotechnical Parameters at the BRC Former C-6 Facility

Sample ID	Date Sampled	Depth	Sieve Analysis	Dry Bulk Density	Moisture Content	Total Porosity	Air-filled Porosity	Water-filled Porosity	TOC*	f _{oc}
		(feet bgs)	(Soil Type)	(kg/L)	(percent by weight)	(fraction by volume)	(fraction by volume)	(fraction by volume)	(mg/kg)	(fraction by weight)
EIA290176-004 (I-34-20)	1/29/2001	20	Silt	1.54	17.5	0.42	0.15	0.27	330	0.0003
EIA290176-004 (I-54-20)	1/29/2001	20	Silt	1.55	17.0	0.42	0.15	0.26	430	0.0003
EIA29176-021 (I-25-20)	1/29/2001	20	Silt	1.37	20.2	0.48	0.20	0.28	410	0.0004
EIA290176-007 (I-34-50)	1/29/2001	50	Fine sand	1.35	4.4	0.51	0.45	0.06	230	0.0002
EIA29176-015 (D-29-50)	1/29/2001		Fine sand	1.36	19.5	0.49	0.22	0.26	560	0.0006
EIA29176-024 (I-25-50)	1/29/2001	50	Silt	1.34	24.3	0.51	0.18	0.32	470	0.0005
Average (25 feet bas to ar	oundurator tab	ula)		1.40	<u>' </u>	0.47	0.22	0.24		0.0004
Average (25 feet bgs to gro	oungwater tab	ne)		1.42		0.47	0.23	0.24		0.0004

0.50

0.28

0.22

1.35

Notes:

The air-filled porosity values were calculated from gravimetric data, not volumetric data.

Average (50 feet bgs to groundwater table)

0.0004

^{*} f_{oc} = the weight fraction of organic carbon in soil = TOC/1,000,000

Table B-2. Soil Particle Size Distribution at BRC Former C-6 Facility

					F	Particle Size Dis	stribution, wt. l	Percent		
Date Sampled	Depth (feet bgs)	Sieve Analysis (Soil Type)	Median Grain Size (mm)	Gravel	Coarse	Sand S Medium	ize Fine	TOTAL	Silt	Clay
1/20/2001	20	Cilt	0.022	0.00	0.00	0.00	21.10	21.10	E4.02	13.99
1/29/2001	20 20	Silt	0.032	0.00	0.00	0.00	27.59	28.49	54.63 59.67	11.85
1/29/2001	20	Silt	0.020	0.00	0.00	0.00	11.21	11.21	69.07	19.72
1/29/2001	50	Fine sand	0.151	0.00	0.00	0.57	79.33	79.90	17.39	2.71
1/29/2001	50	Fine sand	0.083	0.00	0.00	3.26	47.93	51.19	39.79	9.01
1/29/2001	50	Silt	0.027	0.00	0.00	0.04	21.27	21.31	64.99	13.70
	1/29/2001 1/29/2001 1/29/2001 1/29/2001 1/29/2001	1/29/2001 20 1/29/2001 20 1/29/2001 20 1/29/2001 20 1/29/2001 50 1/29/2001 50	Sampled (feet bgs) (Soil Type) 1/29/2001 20 Silt 1/29/2001 20 Silt 1/29/2001 20 Silt 1/29/2001 20 Silt 1/29/2001 50 Fine sand 1/29/2001 50 Fine sand	Sampled (feet bgs) (Soil Type) (mm) 1/29/2001 20 Silt 0.032 1/29/2001 20 Silt 0.036 1/29/2001 20 Silt 0.020 1/29/2001 50 Fine sand 0.151 1/29/2001 50 Fine sand 0.083	Date Sampled Depth (feet bgs) Sieve Analysis (Soil Type) Size (mm) Gravel 1/29/2001 20 Silt 0.032 0.00 1/29/2001 20 Silt 0.036 0.00 1/29/2001 20 Silt 0.020 0.00 1/29/2001 50 Fine sand 0.151 0.00 1/29/2001 50 Fine sand 0.083 0.00	Date Sampled Depth (feet bgs) Sieve Analysis (Soil Type) Median Grain Size (mm) Gravel Coarse 1/29/2001 20 Silt 0.032 0.00 0.00 1/29/2001 20 Silt 0.036 0.00 0.00 1/29/2001 20 Silt 0.020 0.00 0.00 1/29/2001 50 Fine sand 0.151 0.00 0.00 1/29/2001 50 Fine sand 0.083 0.00 0.00	Date Sampled Depth (feet bgs) Sieve Analysis (Soil Type) Median Grain Size (mm) Gravel Coarse Medium 1/29/2001 20 Silt 0.032 0.00 0.00 0.00 0.00 1/29/2001 20 Silt 0.036 0.00 0.00 0.90 1/29/2001 20 Silt 0.020 0.00 0.00 0.00 1/29/2001 50 Fine sand 0.151 0.00 0.00 0.57 1/29/2001 50 Fine sand 0.083 0.00 0.00 3.26	Date Sampled Depth (feet bgs) Sieve Analysis (Soil Type) Median Grain Size (mm) Gravel Coarse Medium Fine 1/29/2001 20 Silt 0.032 0.00 0.00 0.00 31.19 1/29/2001 20 Silt 0.036 0.00 0.00 0.90 27.59 1/29/2001 20 Silt 0.020 0.00 0.00 0.00 11.21 1/29/2001 50 Fine sand 0.151 0.00 0.00 0.57 79.33 1/29/2001 50 Fine sand 0.083 0.00 0.00 3.26 47.93	Date Sampled Depth (feet bgs) Sieve Analysis (Soil Type) Size (mm) Gravel Coarse Medium Fine TOTAL 1/29/2001 20 Silt 0.032 0.00 0.00 0.00 31.19 31.19 1/29/2001 20 Silt 0.036 0.00 0.00 0.90 27.59 28.49 1/29/2001 20 Silt 0.020 0.00 0.00 0.00 11.21 11.21 1/29/2001 50 Fine sand 0.151 0.00 0.00 0.57 79.33 79.90 1/29/2001 50 Fine sand 0.083 0.00 0.00 3.26 47.93 51.19	Date Sampled Depth (feet bgs) Sieve Analysis (Soil Type) Size (mm) Gravel Coarse Medium Fine TOTAL Silt 1/29/2001 20 Silt 0.032 0.00 0.00 0.00 31.19 31.19 54.83 1/29/2001 20 Silt 0.036 0.00 0.00 0.90 27.59 28.49 59.67 1/29/2001 20 Silt 0.020 0.00 0.00 0.00 11.21 11.21 69.07 1/29/2001 50 Fine sand 0.151 0.00 0.00 0.57 79.33 79.90 17.39 1/29/2001 50 Fine sand 0.083 0.00 0.00 3.26 47.93 51.19 39.79

Average (25 feet bgs to groundwater table)

37.22 50.96 11.83

8.47

Average (50 feet bgs to groundwater table) 50.80 40.72

Table B-3. Derivation of Soil Attenuation Factor for VOCs and Comparison of Maximum Soil Concentrations to Site-specific SSLs Calculated at 25 Feet Below Ground Surface

CAS No.	Chemical	MCL (mg/L)	K _{oc} ^(1,2)	f _{oc} ⁽³⁾	K _d ^(4,5)	H' ⁽¹⁾	O _w ⁽³⁾	O _a ⁽³⁾	P _b ⁽³⁾	Max. Residual Soil Concentration (mg/kg)	AF at D=15'	Site-specific SSL (mg/kg) at AF = 1	Site-specific SSL (mg/kg) at AF at D=15'	Site-specific SSL (mg/kg) at AF at D=15' and DAF=20	Max > SSL for at AF _T at D=15' and DAF=20?
12672-29-6	Aroclor-1248	5.00E-04	3.1E+05	4.05E-04		3.5E-02	2.4E-01	2.3E-01	1.42E+00	1.30E-01	19	6.29E-02	1.19E+00	2.39E+01	No
7440-38-2	Arsenic	5.00E-02		4.05E-04	2.90E+01		2.4E-01	2.3E-01	1.42E+00	4.50E+00	4	1.46E+00	6.43E+00	1.29E+02	No
7440-41-7	Beryllium	4.00E-03		4.05E-04	7.9E+02		2.4E-01	2.3E-01	1.42E+00	9.20E-01	119	3.16E+00	3.78E+02	7.55E+03	No
50-32-8	Benzo(a)pyrene	2.00E-04	7.87E+05	4.05E-04		1.87E-05	2.4E-01	2.3E-01	1.42E+00	1.30E+01	48	6.38E-02	3.07E+00	6.15E+01	No
117-81-7	Bis(2-ethylhexyl)phthalate	4.00E-03	1.5E+07	4.05E-04		4.2E-06	2.4E-01	2.3E-01	1.42E+00	2.30E+00	925	2.45E+01	2.26E+04	4.52E+05	No
	Chromium (trivalent)	5.00E-02		4.05E-04	1.8E+06		2.4E-01	2.3E-01	1.42E+00	4.40E+01	272110	9.00E+04	2.45E+10	4.90E+11	No
7440-50-8	Copper	1.0E+00		4.05E-04	4.3E+02		2.4E-01	2.3E-01	1.42E+00	5.45E+01	65	4.28E+02	2.77E+04	5.54E+05	No
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.00E-03	5.3E+01	4.05E-04		2.3E-01	2.4E-01	2.3E-01	1.42E+00	6.00E-02	7	1.15E-03	7.78E-03	1.56E-01	No
107-06-2	1,2-Dichloroethane (1,2-DCA)	5.00E-04	3.8E+01	4.05E-04		4.0E-02	2.4E-01	2.3E-01	1.42E+00	8.70E-03	7	9.66E-05	6.55E-04	1.31E-02	No
75-35-4	1,1-Dichloroethene (1,1-DCE)	6.00E-03	6.5E+01	4.05E-04		1.1E+00	2.4E-01	2.3E-01	1.42E+00	1.10E-01	7	2.24E-03	1.52E-02	3.04E-01	No
75-35-4	cis-1,2-DCE	6.00E-03	3.6E+01	4.05E-04		1.7E-01	2.4E-01	2.3E-01	1.42E+00	4.30E-02	7	1.28E-03	8.67E-03	1.73E-01	No
100-41-4	Ethylbenzene	3.00E-01	2.0E+02	4.05E-04		3.2E-01	2.4E-01	2.3E-01	1.42E+00	5.00E+00	7	9.10E-02	6.17E-01	1.23E+01	No
127-18-4	Tetrachloroethene (PCE)	5.00E-03	2.7E+02	4.05E-04		7.5E-01	2.4E-01	2.3E-01	1.42E+00	2.02E-01	7	2.00E-03	1.36E-02	2.72E-01	No
71-55-6	1,1,1-TCA	2.00E-01	1.4E+02	4.05E-04		7.1E-01	2.4E-01	2.3E-01	1.42E+00	1.35E-02	7	6.83E-02	4.63E-01	9.26E+00	No
79-00-5	1,1,2-TCA	5.00E-03	7.5E+01	4.05E-04		3.7E-02	2.4E-01	2.3E-01	1.42E+00	1.80E-02	7	1.04E-03	7.04E-03	1.41E-01	No
79-01-6	Trichloroethene (TCE)	5.00E-03	9.4E+01	4.05E-04		4.2E-01	2.4E-01	2.3E-01	1.42E+00	2.00E-01	7	1.38E-03	9.37E-03	1.87E-01	Yes
1330-20-7	Xylenes	1.75E+00	2.0E+02	4.05E-04		3.0E-01	2.4E-01	2.3E-01	1.42E+00	1.20E+01	7	5.25E-01	3.56E+00	7.13E+01	No

An SSL was not derived for chemicals that do not have promulgated primary MCLs. These chemicals were not included in the assessment of potential degradation to groundwater quality.

AF = Average attenuation factor based on site lithology (distance to groundwater = 40 feet, 37% sand, 51% silt, and 12% clay).

na = not available

K_{oc} = soil organic carbon-water partition coefficient (L/kg)

f_{oc} = site-specific organic carbon content of soil (kg/kg)

 K_{d} = soil-water partition coefficient (L/kg), $K_{\rm oc}~x~f_{\rm oc}$

H' = dimensionless Henry's law constant

O_w = site-specific average water-filled porosity (by volume)

O_a = site-specific average air-filled porosity (by volume)

P_b = dry soil bulk density (kg/L)

Note: This calculation has been updated with the corrected concentration of bis(2-ethylhexyl)phthalate and concentrations detected in boring PL-B1.

⁽¹⁾ Obtained from EPA Region 9 preliminary remediation goal (PRG) physical-chemical data for volatile organic compounds, November 2000

⁽²⁾ Obtained from Risk Assessment Information System (RAIS) Toxicity & Chemical-Specific Factors Data Base, January 2001, http://risk.lsd.ornl.gov/cgi-bin/tox/TOX_select]

⁽³⁾ Site-specific average values

⁽⁴⁾ Obtained from EPA Soil Screening Guidance: Technical Background Document (TBD), EPA/540/R-95/128, July 1996, http://www.epa.gov/oerrpage/superfund/resources/soil/toc.htm

⁽⁵⁾ Risk Assessment Information System (RAIS) Toxicity & Chemical-Specific Factors Data Base, January 2001, http://risk.lsd.ornl.gov/cgi-bin/tox/TOX_select]

Table B-4. Derivation of Soil Attenuation Factors for Non-VOCs at 25 Feet Below Ground Surface

CAS No.	Chemical	K _{oc} ^(1,2,4)	f _{oc} ⁽³⁾	$K_d^{(2,4)}$	H' ⁽¹⁾	O _w ⁽³⁾	O _a ⁽³⁾	P _b ⁽³⁾	O _t	AF _{max}	Distance to Groundwater (feet)	AF _D	AF _T	AF _T
12672-29-6	Aroclor-1248	3.1E+05	4.1E-04		3.5E-02	2.43E-01	2.27E-01	1.42E+00	4.70E-01	734	40	73.38	19.01	19
7440-38-2	Arsenic			2.90E+01		2.43E-01	2.27E-01	1.42E+00	4.70E-01	170	40	17.03	4.41	4
7440-41-7	Beryllium			7.9E+02		2.43E-01	2.27E-01	1.42E+00	4.70E-01	4612	40	461.20	119.45	119
50-32-8	Benzo(a)pyrene	7.87E+05	4.1E-04		1.87E-05	2.43E-01	2.27E-01	1.42E+00	4.70E-01	1861	40	186.14	48.21	48
117-81-7	Bis (2-ethylhexyl)phthalate	1.5E+07	4.1E-04		4.2E-06	2.43E-01	2.27E-01	1.42E+00	4.70E-01	35696	40	3569.57	924.52	925
16065-83-	Chromium (trivalent)			1.8E+06		2.43E-01	2.27E-01	1.42E+00	4.70E-01	10506174	40	1050617.38	272109.90	272110
7440-50-8	Copper			4.3E+02		2.43E-01	2.27E-01	1.42E+00	4.70E-01	2499	40	249.91	64.73	65

na = not available

An AF_T was not derived for chemicals that do not have promulgated primary MCLs. These chemicals were not included in the assessment of potential further degradation to groundwater quality.

AFT were calculated assuming that the depth between chemical impacts and groundwater is 40 feet and that the soil within this portion of the soil column is comprised of 37% sand, 51% silt, and 12% clay.

K_{oc} = soil organic carbon-water partition coefficient (L/kg)

f_{oc} = site-specific organic carbon content of soil (kg/kg)

K_d = soil-water partition coefficient (L/kg), K_{oc} x f_{oc}

H' = dimensionless Henry's law constant

O_w = site-specific average water-filled porosity (by volume)

O_a = site-specific average air-filled porosity (by volume)

Ot = site-specific average total porosity (by volume)

P_b = dry soil bulk density (kg/L)

⁽¹⁾ Obtained from EPA Region 9 preliminary remediation goal (PRG) physical-chemical data for volatile organic compounds, November 2000

⁽²⁾ Obtained from Risk Assessment Information System (RAIS) Toxicity & Chemical-Specific Factors Data Base, January 2001, http://risk.lsd.ornl.gov/cgi-bin/tox/TOX_select]?select=csf

⁽³⁾ Site-specific average values

⁽⁴⁾ Obtained from EPA Soil Screening Guidance: Technical Background Document (TBD), EPA/540/R-95/128, July 1996, http://www.epa.gov/oerrpage/superfund/resources/soil/toc.htm

Table B-5. Derivation of Soil Attenuation Factor for VOCs and Comparison of Maximum Soil Concentrations to Site-specific SSLs Calculated at 40 Feet Below Ground Surface

CAS No.	Chemical	MCL (mg/L)	K _{oc} ^(1,2)	f _{oc} ⁽³⁾	K _d ^(4,5)	H' ⁽¹⁾	O _w ⁽³⁾	O _a ⁽³⁾	Р _в ⁽³⁾	Max. Residual Soil Concentration (mg/kg)	AF at D=15'	Site-specific SSL (mg/kg) at AF = 1	Site-specific SSL (mg/kg) at AF at D=15'	Site-specific SSL (mg/kg) at AF at D=15' and DAF=20	Max > SSL for at AF _T at D=15' and DAF=20?
7440-38-2	Arsenic	5.00E-02		4.05E-04	2.90E+01		2.4E-01	2.3E-01	1.42E+00	2.30E+01	3	1.46E+00	4.16E+00	8.32E+01	No
7440-41-7	Beryllium	4.00E-03		4.05E-04	7.9E+02		2.4E-01	2.3E-01	1.42E+00	4.10E-01	75	3.16E+00	2.36E+02	4.73E+03	No
117-81-7	Bis(2-ethylhexyl)phthalate	4.00E-03	1.5E+07	4.05E-04		4.2E-06	2.4E-01	2.3E-01	1.42E+00	2.00E-01	578	2.45E+01	1.41E+04	2.83E+05	No
16065-83-	Chromium (trivalent)	5.00E-02		4.05E-04	1.8E+06		2.4E-01	2.3E-01	1.42E+00	5.10E+01	170069	9.00E+04	1.53E+10	3.06E+11	No
7440-50-8	Copper	1.0E+00		4.05E-04	4.3E+02		2.4E-01	2.3E-01	1.42E+00	3.30E+01	41	4.28E+02	1.74E+04	3.47E+05	No
100-41-4	Ethylbenzene	3.0E-01	2.0E+02	4.05E-04		3.2E-01	2.4E-01	2.3E-01	1.42E+00	2.00E+00	4	9.10E-02	3.91E-01	7.81E+00	No
75-35-4	1,1-Dichloroethene (1,1-DCE)	6.00E-03	6.5E+01	4.05E-04		1.1E+00	2.4E-01	2.3E-01	1.42E+00	3.50E-01	4	2.24E-03	9.61E-03	1.92E-01	Yes
71-55-6	1,1,1-TCA	2.00E-01	1.4E+02	4.05E-04		7.1E-01	2.4E-01	2.3E-01	1.42E+00	1.50E-02	4	6.83E-02	2.93E-01	5.86E+00	No
79-01-6	Trichloroethene (TCE)	5.00E-03	9.4E+01	4.05E-04		4.2E-01	2.4E-01	2.3E-01	1.42E+00	1.20E-01	4	1.38E-03	5.93E-03	1.19E-01	Yes
1330-20-7	Xylenes	1.75E+00	2.0E+02	4.05E-04		3.0E-01	2.4E-01	2.3E-01	1.42E+00	2.80E+01	4	5.25E-01	2.25E+00	4.51E+01	No

An SSL was not derived for chemicals that do not have promulgated primary MCLs. These chemicals were not included in the assessment of potential degradation to groundwater quality.

AF = Average attenuation factor based on site lithology (distance to groundwater = 25 feet, 37% sand, 51% silt, and 12% clay).

na = not available

K_{oc} = soil organic carbon-water partition coefficient (L/kg)

f_{oc} = site-specific organic carbon content of soil (kg/kg)

 K_d = soil-water partition coefficient (L/kg), K_{oc} x f_{oc}

H' = dimensionless Henry's law constant

O_w = site-specific average water-filled porosity (by volume)

O_a = site-specific average air-filled porosity (by volume)

 P_b = dry soil bulk density (kg/L)

Note: This calculation has been updated with the corrected concentration of bis(2-ethylhexyl)phthalate and concentrations detected in boring PL-B1.

⁽¹⁾ Obtained from EPA Region 9 preliminary remediation goal (PRG) physical-chemical data for volatile organic compounds, November 2000

⁽²⁾ Obtained from Risk Assessment Information System (RAIS) Toxicity & Chemical-Specific Factors Data Base, January 2001, http://risk.lsd.ornl.gov/cgi-bin/tox/TOX_select]-csf

⁽³⁾ Site-specific average values

⁽⁴⁾ Obtained from EPA Soil Screening Guidance: Technical Background Document (TBD), EPA/540/R-95/128, July 1996, http://www.epa.gov/oerrpage/superfund/resources/soil/toc.htm

⁽⁶⁾ Risk Assessment Information System (RAIS) Toxicity & Chemical-Specific Factors Data Base, January 2001, http://risk.lsd.ornl.gov/cgi-bin/tox/TOX_select]

Table B-6. Derivation of Soil Attenuation Factors for Non-VOCs at 40 Feet Below Ground Surface

CAS No.	Chemical	K _{oc} (1,2,4)	f _{oc} ⁽³⁾	K _d ^(2,4)	H' ⁽¹⁾	O _w ⁽³⁾	O _a ⁽³⁾	P _b ⁽³⁾	O _t	AF _{max}	Distance to Groundwater (feet)	AF _D	AF _T	AF _T
7440-38-2	Arsenic			2.90E+01		2.43E-01	2.27E-01	1.42E+00	4.70E-01	170	25	11.02	2.85	3
7440-41-7	Beryllium			7.9E+02		2.43E-01	2.27E-01	1.42E+00	4.70E-01	4612	25	288.63	74.75	75
117-81-7	Bis (2-ethylhexyl)phthalate	1.5E+07	4.1E-04		4.2E-06	2.43E-01	2.27E-01	1.42E+00	4.70E-01	35696	25	2231.36	577.92	578
16065-83-	Chromium (trivalent)			1.8E+06		2.43E-01	2.27E-01	1.42E+00	4.70E-01	10506174	25	656636.24	170068.79	170069
7440-50-8	Copper			4.3E+02		2.43E-01	2.27E-01	1.42E+00	4.70E-01	2499	25	156.57	40.55	41

na = not available

An AF_T was not derived for chemicals that do not have promulgated primary MCLs. These chemicals were not included in the assessment of potential further degradation to groundwater quality.

AFT were calculated assuming that the depth between chemical impacts and groundwater is 25 feet and that the soil within this portion of the soil column is comprised of 37% sand, 51% silt, and 12% clay.

K_{oc} = soil organic carbon-water partition coefficient (L/kg)

f_{oc} = site-specific organic carbon content of soil (kg/kg)

K_d = soil-water partition coefficient (L/kg), K_{oc} x f_{oc}

H' = dimensionless Henry's law constant

O_w = site-specific average water-filled porosity (by volume)

O_a = site-specific average air-filled porosity (by volume)

Ot = site-specific average total porosity (by volume)

P_b = dry soil bulk density (kg/L)

⁽¹⁾ Obtained from EPA Region 9 preliminary remediation goal (PRG) physical-chemical data for volatile organic compounds, November 2000

⁽²⁾ Obtained from Risk Assessment Information System (RAIS) Toxicity & Chemical-Specific Factors Data Base, January 2001, http://risk.lsd.ornl.gov/cgi-bin/tox/TOX_select?select=csf

⁽³⁾ Site-specific average values

⁽⁴⁾ Obtained from EPA Soil Screening Guidance: Technical Background Document (TBD), EPA/540/R-95/128, July 1996, http://www.epa.gov/oerrpage/superfund/resources/soil/toc.htm

Table B-7. Derivation of Soil Attenuation Factor for VOCs and Comparison of Maximum Soil Concentrations to Site-specific SSLs Calculated at 50 Feet Below Ground Surface

CAS No.	Chemical	MCL (mg/L)	K _{oc} ^(1,2)	f _{oc} ⁽³⁾	$K_d^{(4,5)}$	H' ⁽¹⁾	O _w ⁽³⁾	O _a ⁽³⁾	P _b ⁽³⁾	Max. Residual Soil Concentration (mg/kg)	AF at D=15'	Site-specific SSL (mg/kg) at AF = 1	Site-specific SSL (mg/kg) at AF at D=15'	one opeeme	Max > SSL for at AF _T at D=15' and DAF=20?
7440-38-2	Arsenic	5.00E-02		4.05E-04	2.90E+01		2.4E-01	2.3E-01	1.42E+00	2.30E+01	2	1.46E+00	2.32E+00	4.63E+01	No
7440-41-7	Beryllium	4.00E-03		4.05E-04	7.9E+02		2.4E-01	2.3E-01	1.42E+00	4.10E-01	40	3.16E+00	1.25E+02	2.50E+03	No
117-81-7	Bis(2-ethylhexyl)phthalate	4.00E-03	1.5E+07	4.05E-04		4.2E-06	2.4E-01	2.3E-01	1.42E+00	1.30E-01	317	2.45E+01	7.75E+03	1.55E+05	No
16065-83-	Chromium (trivalent)	5.00E-02		4.05E-04	1.8E+06		2.4E-01	2.3E-01	1.42E+00	5.10E+01	89860	9.00E+04	8.09E+09	1.62E+11	No
7440-50-8	Copper	1.0E+00		4.05E-04	4.3E+02		2.4E-01	2.3E-01	1.42E+00	3.30E+01	22	4.28E+02	9.21E+03	1.84E+05	No
75-35-4	1,1-Dichloroethene (1,1-DCE)	6.00E-03	6.5E+01	4.05E-04		1.1E+00	2.4E-01	2.3E-01	1.42E+00	1.60E-01	2	2.24E-03	4.77E-03	9.55E-02	Yes
71-55-6	1,1,1-TCA	2.00E-01	1.4E+02	4.05E-04		7.1E-01	2.4E-01	2.3E-01	1.42E+00	1.50E-02	2	6.83E-02	1.45E-01	2.91E+00	No
79-01-6	Trichloroethene (TCE)	5.00E-03	9.4E+01	4.05E-04		4.2E-01	2.4E-01	2.3E-01	1.42E+00	1.10E-01	2	1.38E-03	2.94E-03	5.89E-02	Yes

An SSL was not derived for chemicals that do not have promulgated primary MCLs. These chemicals were not included in the assessment of potential degradation to groundwater quality.

AF = Average attenuation factor based on site lithology (distance to groundwater = 15 feet, 51% sand, 41% silt, and 8% clay).

na = not available

K_{oc} = soil organic carbon-water partition coefficient (L/kg)

f_{oc} = site-specific organic carbon content of soil (kg/kg)

K_d = soil-water partition coefficient (L/kg), K_{oc} x f_{oc}

H' = dimensionless Henry's law constant

O_w = site-specific average water-filled porosity (by volume)

O_a = site-specific average air-filled porosity (by volume)

 $P_b = dry soil bulk density (kg/L)$

Note: This calculation has been updated with the corrected concentration of bis(2-ethylhexyl)phthalate.

⁽¹⁾ Obtained from EPA Region 9 preliminary remediation goal (PRG) physical-chemical data for volatile organic compounds, November 2000

⁽²⁾ Obtained from Risk Assessment Information System (RAIS) Toxicity & Chemical-Specific Factors Data Base, January 2001, http://risk.lsd.ornl.gov/cgi-bin/tox/TOX_select?select=csf

⁽³⁾ Site-specific average values

⁽⁴⁾ Obtained from EPA Soil Screening Guidance: Technical Background Document (TBD), EPA/540/R-95/128, July 1996, http://www.epa.gov/oerrpage/superfund/resources/soil/toc.htm

⁽⁵⁾ Risk Assessment Information System (RAIS) Toxicity & Chemical-Specific Factors Data Base, January 2001, http://risk.lsd.ornl.gov/cgi-bin/tox/TOX_select]

Table B-8. Derivation of Soil Attenuation Factors for Non-VOCs at 50 Feet Below Ground Surface

CAS No.	Chemical	K _{oc} (1,2,4)	f _{oc} ⁽³⁾	$K_{d}^{(2,4)}$	H' ⁽¹⁾	O _w ⁽³⁾	O _a ⁽³⁾	P _b ⁽³⁾	O _t	AF _{max}	Distance to Groundwater (feet)	AF _D	AF _T	AF _T
7440-38-2	Arsenic			2.90E+01		2.16E-01	2.85E-01	1.35E+00	5.01E-01	182	15	7.46	1.59	2
7440-41-7	Beryllium			7.9E+02		2.16E-01	2.85E-01	1.35E+00	5.01E-01	4939	15	185.82	39.58	40
117-81-7	Bis (2-ethylhexyl)phthalate	1.5E+07	4.20E-04		4.2E-06	2.16E-01	2.85E-01	1.35E+00	5.01E-01	39639	15	1487.07	316.75	317
16065-83-	Chromium (trivalent)			1.8E+06		2.16E-01	2.85E-01	1.35E+00	5.01E-01	11250001	15	421875.66	89859.52	89860
7440-50-8	Copper			4.3E+02		2.16E-01	2.85E-01	1.35E+00	5.01E-01	2676	15	100.98	21.51	22

na = not available

An AF_T was not derived for chemicals that do not have promulgated primary MCLs. These chemicals were not included in the assessment of potential further degradation to groundwater quality.

AFT were calculated assuming that the depth between chemical impacts and groundwater is 15 feet and that the soil within this portion of the soil column is comprised of 51% sand, 41% silt, and 8% clay.

K_{oc} = soil organic carbon-water partition coefficient (L/kg)

f_{oc} = site-specific organic carbon content of soil (kg/kg)

K_d = soil-water partition coefficient (L/kg), K_{oc} x f_{oc}

H' = dimensionless Henry's law constant

O_w = site-specific average water-filled porosity (by volume)

O_a = site-specific average air-filled porosity (by volume)

Ot = site-specific average total porosity (by volume)

P_b = dry soil bulk density (kg/L)

⁽¹⁾ Obtained from EPA Region 9 preliminary remediation goal (PRG) physical-chemical data for volatile organic compounds, November 2000

⁽²⁾ Obtained from Risk Assessment Information System (RAIS) Toxicity & Chemical-Specific Factors Data Base, January 2001, http://risk.lsd.ornl.gov/cgi-bin/tox/TOX_select?select=csf

⁽³⁾ Site-specific average values

⁽⁴⁾ Obtained from EPA Soil Screening Guidance: Technical Background Document (TBD), EPA/540/R-95/128, July 1996, http://www.epa.gov/oerrpage/superfund/resources/soil/toc.htm

Table B-10. Derivation of Estimated Maximum VOC Concentrations in Groundwater at Parcel A Using a Site-specific SSL Equation

CAS No.	Chemical	Max. Residual Soil Concentration (mg/kg)	K _{oc} ⁽¹⁾	f _{oc} ⁽²⁾	K _d ⁽³⁾	H' ⁽¹⁾	O _w ⁽²⁾	O _a ⁽²⁾	P _b ⁽²⁾	Pore Water Conc. (mg/L)	Groundwater Conc. (mg/L) = Pore Water Conc. / AF / DAF
104-51-8	n-Butylbenzene	3.10E+00	2.8E+03	4.05E-04		5.4E-01	2.4E-01	2.3E-01	1.42E+00	2.2E+00	1.1E-01
75-34-3	1.1-DCA	6.00E-02	5.3E+01	4.05E-04		2.3E-01	2.4E-01	2.3E-01	1.42E+00	2.6E-01	1.3E-02
107-06-2	1,2-DCA	8.70E-03	3.8E+01	4.05E-04		4.0E-02	2.4E-01	2.3E-01	1.42E+00	4.5E-02	2.3E-03
75-35-4	1.1-DCE	3.50E-01	6.5E+01	4.05E-04		1.1E+00	2.4E-01	2.3E-01	1.42E+00	9.4E-01	4.7E-02
540-59-0	1,2-DCE	6.10E-03	3.7E+01	4.05E-04		2.9E+00	2.4E-01	2.3E-01	1.42E+00	9.5E-03	4.7E-04
156-59-2	cis-1,2-DCE	4.30E-02	3.6E+01	4.05E-04		1.7E-01	2.4E-01	2.3E-01	1.42E+00	2.0E-01	1.0E-02
100-41-4	Ethylbenzene	5.00E+00	2.0E+02	4.05E-04		3.2E-01	2.4E-01	2.3E-01	1.42E+00	1.6E+01	8.2E-01
127-18-4	PCÉ	2.02E-01	2.7E+02	4.05E-04		7.5E-01	2.4E-01	2.3E-01	1.42E+00	5.0E-01	2.5E-02
103-65-1	n-Propylbenzene	2.50E+00	2.8E+03	4.05E-04		5.4E-01	2.4E-01	2.3E-01	1.42E+00	1.8E+00	9.0E-02
71-55-6	1,1,1-TCA	1.50E-02	1.4E+02	4.05E-04		7.1E-01	2.4E-01	2.3E-01	1.42E+00	4.4E-02	2.2E-03
79-00-5	1,1,2-TCA	1.80E-02	7.5E+01	4.05E-04		3.7E-02	2.4E-01	2.3E-01	1.42E+00	8.7E-02	4.3E-03
79-01-6	TCE	2.00E-01	9.4E+01	4.05E-04		4.2E-01	2.4E-01	2.3E-01	1.42E+00	7.2E-01	3.6E-02
95-63-6	1,2,4-TMB	4.50E+01	3.7E+03	4.05E-04		2.3E-01	2.4E-01	2.3E-01	1.42E+00	2.6E+01	1.3E+00
108-67-8	1,3,5-TMB	1.50E+01	8.2E+02	4.05E-04		3.2E-01	2.4E-01	2.3E-01	1.42E+00	2.7E+01	1.4E+00
108-88-3	Toluene	6.90E-01	1.4E+02	4.05E-04		2.7E-01	2.4E-01	2.3E-01	1.42E+00	2.5E+00	1.3E-01
1330-20-7	Xylene	2.80E+01	2.0E+02	4.05E-04		3.0E-01	2.4E-01	2.3E-01	1.42E+00	9.3E+01	4.7E+00

K_{oc} = soil organic carbon-water partition coefficient (L/kg)

f_{oc} = organic carbon content of soil (kg/kg)

 K_d = soil-water partition coefficient (L/kg), $K_{oc} \times f_{oc}$

H' = dimensionless Henry's law constant

O_w = site-specific average water-filled porosity (by volume)

O_a = site-specific average air-filled porosity (by volume)

P_b = dry soil bulk density (kg/L)

Note: This calculation includes updated maximum residual soil concentrations for 1,1-DCE and TCE and concentrations detected in boring PL-B1.

⁽¹⁾ Obtained from EPA Region 9 preliminary remediation goal (PRG) physical-chemical data for volatile organic compounds, November 2000

⁽²⁾ Site-specific average values

⁽³⁾ Obtained from EPA Soil Screening Guidance: Technical Background Document (TBD), EPA/540/R-95/128, dated July 1996, http://www.epa.gov/oerrpage/superfund/resources/soil/toc.htm

TABLE B-12 SUMMARY OF CUMMULATIVE RISK INCLUDING BORING PL-B1 FORMER C-6 FACILITY, PARCEL LOS ANGELES, CALIFORNIA

		Onsite	Onsite DTSC
	Onsite Construction	Commercial/Industrial	Commercial/Industrial
	Worker (Highest of	Worker (Highest of AOPC	Worker (Highest of
	AOPC 1 and AOPC 2)	1 and AOPC 2)	AOPC 1 and AOPC 2)
Hazard Index			
Previously Estimated	0.051	0.000087	0.0046
Vapor Migration from Groundwater	NA	0.0024	0.0024
Vapor Migration from Deep Soil	NA	0.075	0.075
Vapor Migration from Deep Soil			
Leachate and Subsequent Volatilization			
from Groundwater	NA	0.0082	0.0082
Total	0.051	0.086	0.090
Excess Cancer Risk			
Previously Estimated	1.4E-06	1.7E-10	4.4E-06
Vapor Migration from Groundwater	NA	2.9E-06	2.9E-06
Vapor Migration from Deep Soil	NA	NA	NA
Vapor Migration from Deep Soil			
Leachate and Subsequent Volatilization			
from Groundwater	NA	7.0E-08	7.0E-08
Total	1.4E-06	3.0E-06	7.4E-06

NA = Not applicable

AOPC = Area of Potential Concern (Two areas of potential concern were identified for Parcel A in the post-demolition risk assessment.)



SUMMARY OF VAPOR MIGRATION RESULTS - COMMERCIAL/LIGHT INDUSTRIAL SCENARIO BRC Former C-6 Facility, Los Angeles, California Deep Soil Leaching to Groundwater and Subsequent Volatilization to Indoor Air

Groundwater

CAS No.	Chemical	Estimated Concentration in Groundwater (ug/L)	Cancer Risk	Hazard Index
104-51-8	n-Butylbenzene	110	No Slope Factor	0.00010
75-34-3	1,1-Dichloroethane (1,1-DCA)	13	1.1E-10	0.0000037
107-06-2	1,2-Dichloroethane (1,2-DCA)	2.3	5.4E-11	0.00000019
75-34-3	1,1-Dichloroethylene (1,1-DCE)	47	6.8E-08	0.00005
156-59-2	cis-1,2-Dichloroethylene (cis 1,2-DCE)	10	No Slope Factor	0.0000030
100-41-4	Ethylbenzene	820	No Slope Factor	0.0000081
103-65-1	n-Propylbenzene	90	No Slope Factor	0.000086
127-18-4	Tetrachloroethene (PCE)	25	2.4E-09	0.000032
71-55-6	1,1,1-Trichloroethane	2.2	No Slope Factor	0.0000010
79-00-5	1,1,2-Trichloroethane	4.3	5.9E-11	0.00000073
79-01-6	Trichloroethlyene (TCE)	36	1.0E-09	0.0000016
95-63-6	1,2,4-Trimethylbenzene	1,300	No Slope Factor	0.0031
108-67-8	1,3,5-Trimethylbenzene	1,400	No Slope Factor	0.0046
108-88-3	Toluene	130	No Slope Factor	0.0000084
1330-20-7	Xylene	4,700	No Slope Factor	0.00012

Total 7E-08 0.0082

Note: This calculation has been updated with concentrations of volatile organic compounds detected in PL-B1 as well as corrected concentrations of 1,1-dichloroethene and trichloroethene.

 $\label{lem:conditions} G:\28882\ C-6\634\ C-evised\ Appendix\ C-evised\ Appendix\ C-evised\ Appendix\ C-evised\ Appendix\ C-evised\ C-$

Risk Calculations Version: November 1999

Project Name: BRC Former Boeing C-6 Facility, Los Angeles, California

Chemical: 1,1 - Dichloroethane (1,1-DCA)

Variable Descriptions Units

CALCULATION OF SOIL GAS CONCENTRATION

A. SOURCE - Free Product/Soil>100mg/kg.		
Mole fraction MF	- = ·	0.00E+00 dimensionless
Molecular weight MW	=	9.90E+04 mg/mole
Vapor pressure VP		3.08E-01 atm
Universal gas constant R	= -	8.20E-05 atm-m3/mole-K
		order and an analysis of the contract of the c

Temperature 2.93E+02 K Calculated soil gas concentration $C_{sq}(fp)$ 0.00E+00 mg/m3

B. SOURCE - Groundwater

Water contamination level C_{w} 1.30E+01 ug/l

Henry's Law Constant 2.30E-01 dimensionless

Calculated soil gas concentration $C_{sg}(gw)$ 2.99E+00 mg/m3

SOURCE - Soil < 100 mg/kg			
Soil contamination level	C_{t}	= :	mg/kg
Henry's Law Constant	Н	= -	2.30E-01 dimensionless
Bulk density (dry)	$\rho_{\rm b}$	=	1.50E+00 gm/cc
Air-filled porosity	θ_a	=	2.84E-01 dimensionless
Water-filled porosity	θ_{w}		1.50E-01 dimensionless
Weight fraction of organic carbon	f _{oc}	= :	4.00E-03 dimensionless
Organic carbon partition coefficient	K _{oc}	=	5.30E+01 cm3/gm
Soil/water distribution coef.	K_d	=	2.12E-01 cm3/gm
Calculated soil gas concentration	C _{sg} (s)	$\hat{\boldsymbol{x}}^{(i)} = \boldsymbol{x}^{(i)}$	0.00E+00 mg/m3

D. SOURCE - Measured Soil Gas

 $C_{sq}(m)$ Measured soil gas concentration mg/m3 (ug/l)

E. SOIL GAS CONCENTRATION USED IN RISK CALCULATIONS >>>> 2.99E+00 mg/m3

<u>DIFFUSIVE TRANSPORT UPWARD IN UNSATURATED ZONE</u>

Depth of contamination or Csg	Χ	=	1.98E+01	
Diffusion coefficient in air Effective diffusion coefficient	D _a	=	7.40E-02	cm2/sec
Air-filled porosity				
Total porosity				dimensionles

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SITE ASSESSMENT & MITIGATION VAPOR RISK ASSESSMENT MODEL Risk Calculations

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(C	A١	_(J	IL	Α	Ī	Ш	J(3	V	1	\P	C)[₹	C	C	1	IC	Έ	N	T	R	A	T	1)	N	ĺ١	V.	В	U	ΙL	D	١	IC	÷

A. INDOOR AIR COMPONENT				
Floor area of building	Α	= .	9.68E+02	m 2
% of floor area that flux occurs			1.00E+00	dimensionless
Attenuation factor(Crack factor)	S_b	= .	1.00E-02	dimensionless
Flux area within building	Af	=	9.68E+00	m2
Interior Height of building	R _h	$\dot{x}=\dot{x}^{-1}$	2.44E+00	m
Volume of building	Λ	= :	2.36E+03	m3
Exchange rate of air	E	:=;	8.30E-01	exchanges/hr
Ventilation rate	Q	= 1	1.96E+03	m3/hr
Indoor air component	Ci	$\dot{x}=\dot{x}^{-1}\dot{x}^{-1}$	1.59E-06	mg/m3
B. OUTDOOR AIR COMPONENT				
Downwind contamination length	Ĺ	= .		m
Wind speed	u	= : :		m/hr
Height of building openings	h	=		m
(or height of breathing zone)				
Outdoor air component	Co	=.	0.00E+00	
C. TOTAL INDOOR AIR CONCENTRATION	Ct	= .	1.59E-06	mg/m3
EXPOSURE SCENARIO				
Body weight	BW	=	7.00E+01	
Inhalation rate	IR	=	2.00E+01	
Exposure duration	ED	•=; ;;	2.50E+01	
Hours per day	conversion		8.00E+00	
Exposure time	· — ·	=		hr/24 hours
Days per week	conversion			days/week
Weeks per year	conversion		5.00E+01	
Exposure frequency	EF		1.25E+02	
Averaging Time (carc. risk)		=	2.56E+04	
Averaging Time (non-carc. risk)	AT	=	9.13E+03	days
Observation I have be County and IA	1 T		4 OFF 00	and and local colleges
Chemical Intake (carc. risk)	Carrier and the second of the con-	1.0		mg/kg-day
Chemical Intake (non-carc. risk)	IT _{nc}	= .	5.20E-08	mg/kg-day
NON CARCINOCENIC RICK (Charle Black)				
NON-CARCINOGENIC RISK (Chronic Risk)	1 T		E 20E 00	والمنافعة المعالمة
Chemical Intake (non-carc. risk)	IT _{nc}			mg/kg-day
Reference dose	RfD		1.40E-01 3.71E-07	mg/kg-day
Hazard Index	HI	=	3./ IE-U/	
CARCINOGENIC RISK				
Chemical Intake (carc. risk)	ITc	=	1.85E-08	mg/kg-day
Slope factor (potency)	SF			1/(mg/kg-day)
Cancer Risk	Risk	= 1	1.06E-10	
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Version: November 1999

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Risk Calculations

Project Name: BRC Former Boeing C-6 Facility, Los Angeles, California

Chemical: 1,2-Dichloroethane (EDC)

Variable Descriptions Units

CALCULATION OF SOIL GAS CONCENTRATION

CALCULATION OF SUIL GAS CONCENTRA	<u>IIUN</u>			granda ang Proposition (salah)
A. SOURCE - Free Product/Soil>100mg/kg.				
Mole fraction	MF	:	0.00E+00	dimensionless
Molecular weight	MW	_ =	9.90E+04	•
Vapor pressure	VP	$\hat{x}_{i} = \hat{x}_{i}$	1.14E-01	
Universal gas constant	R	= :	8.20E-05	atm-m3/mole-K
Temperature	\mathbf{T}	= :	2.93E+02	[K]
Calculated soil gas concentration	C _{sg} (fp)	$\frac{1}{2} := \frac{1}{2} \cdot \frac{1}{2}$	0.00E+00	mg/m3
B. SOURCE - Groundwater			**************************************	
Water contamination level	C _w	= :	2.30E+00	ug/l
Henry's Law Constant	H	= .	4.00E-02	dimensionless
Calculated soil gas concentration	C _{sg} (gw)	$\dot{x} = 0$	9.20E-02	mg/m3
C. SOURCE - Soil < 100 mg/kg				
Soil contamination level	C_t	=		mg/kg
Henry's Law Constant	Н	=	4.00E-02	dimensionless
Bulk density (dry)	$ ho_{ m b}$	=	1.50E+00	gm/cc
Air-filled porosity	θ_a	- = -	2.84E-01	dimensionless
Water-filled porosity	θ_{w}	= :	1.50E-01	dimensionless
Weight fraction of organic carbon	f _{oc}	= .	4.00E-03	dimensionless
Organic carbon partition coefficient	K _{oc}	=	3.80E+01	cm3/gm
Soil/water distribution coef.	K _d	=	1.52E-01	cm3/gm
Calculated soil gas concentration	C _{sg} (s)	. : := : :	0.00E+00	mg/m3
D. SOURCE - Measured Soll Gas				

E. SOIL GAS CONCENTRATION USED IN RISK CALCULATIONS >>> 9.20E-02 mg/m3

 $C_{sq}(m)$

mg/m3 (ug/l)

DIFFUSIVE TRANSPORT UPWARD IN UNSATURATED ZONE

Measured soil gas concentration

Total porosity Air-filled porosity				dimensionless dimensionless
				and the second s
Diffusion coefficient in air	D _a	=	1.00E-01	cm2/sec
Effective diffusion coefficient	D _e	= :	8.03E-03	cm2/sec
Depth of contamination or Csg	X	=	1.98E+01	m
Calculated Flux	F _x	=::	1.34E-05	mg/m2-hour

SITE ASSESSMENT & MITIGATION VAPOR RISK ASSESSMENT MODEL Risk Calculations

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j	CALCU	LAT	ING V	APOR	CONCENT	RATION	IN BUILDING	

A. INDOOR AIR COMPONENT				
Floor area of building	Α	= .	9.68E+02	m2
% of floor area that flux occurs			1.00E+00	dimensionless
Attenuation factor(Crack factor)	S_{b}	=	1.00E-02	dimensionless
Flux area within building	Af	=	9.68E+00	m 2
Interior Height of building	R _h	=	2.44E+00	m
Volume of building	Λ	=: ::	2.36E+03	m3
Exchange rate of air	E	= 1 1 1	8.30E-01	exchanges/hr
Ventilation rate	Q	= "."	1.96E+03	m3/hr
Indoor air component	Ci	=: ' :	6.63E-08	mg/m3
B. OUTDOOR AIR COMPONENT			ia Standarda de estado	
Downwind contamination length	L	=		m
Wind speed	u	= 1 1		m/hr
Height of building openings	h	=:::::		m
(or height of breathing zone)				
Outdoor air component	Co	= :	0.00E+00	mg/m3
C. TOTAL INDOOR AIR CONCENTRATION	Ct	=	6.63E-08	mg/m3
EXPOSURE SCENARIO		· · · · · . · · · · · .		
Body weight		=	7.00E+01	
Inhalation rate	IR	= "	2.00E+01	
Exposure duration	ED	.=:	2.50E+01	
Hours per day	conversion		8.00E+00	
Exposure time	. — 1 - 44 - 44 - 44	= 1 1 1		hr/24 hours
Days per week	conversion		i contract of the contract of	days/week
Weeks per year	conversion		5.00E+01	
Exposure frequency	EF		1.25E+02	
Averaging Time (carc. risk)	The second second second	=	2.56E+04	
Averaging Time (non-carc. risk)	AT	=	9.13E+03	days
Chamical Intoba (anno visità	IT _c		7 70E 10	mg/kg-day
Chemical Intake (carc. risk)			the first of the second of the	
Chemical Intake (non-carc. risk)	IT _{nc}	=	2.16E-09	mg/kg-day
NON-CARCINOGENIC RISK (Chronic Risk)				
Chemical Intake (non-carc. risk)	IT _{nc}	=	2 16F-09	mg/kg-day
Reference dose	RfD			mg/kg-day
Hazard Index	HI		1.89E-08	mg/kg-day
CARCINOGENIC RISK				
Chemical Intake (carc. risk)	IT_{c}	= .	7.70E-10	mg/kg-day
Slope factor (potency)	SF	=	7.00E-02	1/(mg/kg-day)
Cancer Risk	Risk	=	No. 6 Co.	

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Risk Calculations Version: November 1999

Project Name: BRC Former Boeing C-6 Facility, Los Angeles, California

Chemical: 1,1-Dichloroethylene (1,1-DCE)

Variable Descriptions Units

CALCULATION OF SOIL GAS CONCENTRATION

Α.	SOURC	E - Fre	e Produ	ɪct/Soil>ˈ	100mg/kg.
	And the second		and the second		0 0

	Mole fraction	0.00E+0	0 dimensionless
٠.	Molecular weight = MW =	9.70E+0	4 mg/mole
	Vapor pressure VP =	7.78E-0	1 atm

Universal gas constant R = 8.20E-05 atm-m3/mole-K

Temperature T = 2.93E+02 K

Calculated soil gas concentration $C_{sg}(fp) = 0.00E+00 \text{ mg/m}^3$

B. SOURCE - Groundwater

Water contamination level $C_w = 4.70E+01 \text{ ug/l}$

Henry's Law Constant H = 1.10E+00 dimensionless

Calculated soil gas concentration $C_{sq}(gw) = 5.17E+01 \text{ mg/m}3$

C. SOURCE - Soil < 100 mg/kg

Soil/water distribution coef. $K_d = 2.60E-01 \text{ cm}3/\text{gm}$ Calculated soil gas concentration $C_{sg}(s) = 0.00E+00 \text{ mg/m}3$

D. SOURCE - Measured Soil Gas

Measured soil gas concentration $C_{sg}(m) = mg/m3 (ug/l)$

E. SOIL GAS CONCENTRATION USED IN RISK CALCULATIONS >>> 5.17E+01 mg/m3

DIFFUSIVE TRANSPORT UPWARD IN UNSATURATED ZONE

Total porosity	θ	$\lambda = 1_{100000000000000000000000000000000000$	4.34E-01	dimensionless
Air-filled porosity	θ_a	=	2.84E-01	dimensionless
Diffusion coefficient in air	Da	=	9.00E-02	cm2/sec
Effective diffusion coefficient	De	=:::	7.22E-03	cm2/sec
Depth of contamination or Csg	Χ	= -	1.98E+01	m
Calculated Flux	. F _x	=	6.79E-03	mg/m2-hour

SITE ASSESSMENT & MITIGATION VAPOR RISK ASSESSMENT MODEL Risk Calculations

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j	CAL	CUL	AT	ING	V	۱PC	RC	ONC	ENT	RA	TION IN	I BUILDI	NG

A. INDOOR AIR COMPONENT				
Floor area of building	A	=	9.68E+02	m2
% of floor area that flux occurs			1.00E+00	dimensionless
Attenuation factor(Crack factor)	S _b	=	1.00E-02	dimensionless
Flux area within building	Af	= .	9.68E+00	m2
Interior Height of building	R _h	=	2.44E+00	m
Volume of building	ν.	=	2.36E+03	m3
Exchange rate of air	E	=; 1, 1,	8.30E-01	exchanges/hr
Ventilation rate	Q	= .	1.96E+03	m3/hr
Indoor air component	Ci	=: '-	3.35E-05	mg/m3
B. OUTDOOR AIR COMPONENT				
Downwind contamination length	L	= .		m
Wind speed	u	= ,		m/hr
Height of building openings	h	= 1.1		m
(or height of breathing zone)				
Outdoor air component	Co	= .	0.00E+00	mg/m3
C. TOTAL INDOOR AIR CONCENTRATION	Ct	= .	3.35E-05	mg/m3
lestier trife and protection en				
EXPOSURE SCENARIO				
Body weight	BW		7.00E+01	
Inhalation rate	IR	=::::::::::::::::::::::::::::::::::::::		
Exposure duration	ED		2.50E+01	
Hours per day	conversion	1,11	8.00E+00	
Exposure time	- - • •• •• •• • • •	=		hr/24 hours
Days per week	conversion	400		days/week
Weeks per year	conversion		5.00E+01	
Exposure frequency			1.25E+02	
Averaging Time (carc. risk)	and the contract of the contract of	=::::::::::::::::::::::::::::::::::::::	2.56E+04	
Averaging Time (non-carc. risk)	AI	=	9.13E+03	uays
Chemical Intake (carc. risk)	ITc	=	2 00E 07	mg/kg-day
Chemical Intake (carc. risk) Chemical Intake (non-carc. risk)	IT _{nc}	= .	the second second second	mg/kg-day
Chemical intake (non-carc. risk)	''nc		1.09E-00	ing/kg-day
NON-CARCINOGENIC RISK (Chronic Risk)				
Chemical Intake (non-carc. risk)	IT _{nc}	= 1	1.00 = 06	mg/kg-day
Reference dose	RfD		1.0	mg/kg-day
Hazard Index	HI	- =	5.47E-05	
HIGEAL WILLIAM HIGEA	. • • •		3.47 L-03	
CARCINOGENIC RISK				
Chemical Intake (carc. risk)	$IT_{\mathbf{c}}$	=	3.90E-07	mg/kg-day
Slope factor (potency)	SF			1/(mg/kg-day)
Cancer Risk	Risk	: !=::::	6.82E-08	
	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			

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Risk Calculations

Version: November 1999

Project Name: BRC Former Boeing C-6 Facility, Los Angeles, California

Chemical: cis-1,2-Dichloroethylene (cis 1,2-DCE)

Variable Descriptions Units

CALCULATION OF SOIL GAS CONCENTRATION

A. SOURCE - Free Prod	uct/Soll>100ma/ka.
-----------------------	--------------------

	Mole fraction	MF	= 0.00E+00	dimensionless
٠.	Molecular weight	MW	= 9.70E+04	mg/mole
· .	Vapor pressure	VP	= 2.40E-04	atm

8.20E-05 atm-m3/mole-K Universal gas constant R

Temperature Т 2.93E+02 K

Calculated soil gas concentration C_{sq}(fp) 0.00E+00 mg/m3

B. SOURCE - Groundwater

 C_{w} Water contamination level = 1.00E+01 ug/l

Henry's Law Constant 1.70E-01 dimensionless H

Calculated soil gas concentration $C_{sq}(gw)$ 1.70E+00 mg/m3

C. SOURCE - Soil < 100 mg/kg

 C_{t} Soil contamination level mg/kg Henry's Law Constant Н 1.70E-01 dimensionless Bulk density (dry) 1.50E+00 gm/cc ρ_{b} Air-filled porosity θ_a 2.84E-01 dimensionless Water-filled porosity $\theta_{\rm w}$ 1.50E-01 dimensionless Weight fraction of organic carbon f_{oc} 4.00E-03 dimensionless Koc Organic carbon partition coefficient 3.60E+01 cm3/gm

 K_{c} Soil/water distribution coef. 1.44E-01 cm3/gm Calculated soil gas concentration $C_{sq}(s)$ 0.00E+00 mg/m3

D. SOURCE - Measured Soil Gas

 $C_{sq}(m)$ Measured soil gas concentration mg/m3 (ug/l)

E. SOIL GAS CONCENTRATION USED IN RISK CALCULATIONS >>>> 1.70E+00 mg/m3

<u>DIFFUSIVE TRANSPORT UPWARD IN UNSATURATED ZONE</u>

Total porosity				dimensionless
Air-filled porosity	θ_{a}	=	2.84E-01	dimensionless
Diffusion coefficient in air	Da	=	7.40E-02	cm2/sec
Effective diffusion coefficient	D _e	=::	5.94E-03	cm2/sec
Depth of contamination or Csg				
Calculated Flux	F _x	= .	1.83E-04	mg/m2-hour

SITE ASSESSMENT & MITIGATION VAPOR RISK ASSESSMENT MODEL Risk Calculations

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j	CAL	CUL	AT	ING	V	۱PC	RC	ONC	ENT	RA	TION IN	I BUILDI	NG

A. INDOOR AIR COMPONENT	·			
Floor area of building	Α	= 1	9.68E+02	m2
% of floor area that flux occurs			1.00E+00	dimensionless
Attenuation factor(Crack factor)	S_{b}	=	1.00E-02	dimensionless
Flux area within building	Af	=	9.68E+00	m 2
Interior Height of building	R _h	=	2.44E+00	m
Volume of building	Λ.	= 1	2.36E+03	m3
Exchange rate of air	E.	= 1 1 1	8.30E-01	exchanges/hr
Ventilation rate	Q	= '	1.96E+03	•
Indoor air component	Ci	=: " ."	9.06E-07	mg/m3
B. OUTDOOR AIR COMPONENT				
Downwind contamination length		=		m
Wind speed	u	= '- [m/hr
Height of building openings	h	= :		m
(or height of breathing zone)				
Outdoor air component	Co	= .	0.00E+00	mg/m3
C. TOTAL INDOOR AIR CONCENTRATION	Ct	=	9.06E-07	mg/m3
lle tier te leur goete goese elle oor te dit tot van die de land van de steel en de steel e. De tredigielse de leige mit gekeen dit dit dit de dit de steel de de dit de d				
EXPOSURE SCENARIO				
Body weight	The second of th	=	7.00E+01	
Inhalation rate		= [2.00E+01	
Exposure duration	. = =	=	2.50E+01	
Hours per day	conversion	free free	8.00E+00	
Exposure time	ΕT	1.0		hr/24 hours
Days per week	conversion	7		days/week
Weeks per year	conversion	1967	5.00E+01	
Exposure frequency	. —	= .	1.25E+02	
Averaging Time (carc. risk)		=	2.56E+04	
Averaging Time (non-carc. risk)	AT	=	9.13E+03	uays
Chemical Intake (carc. risk)	IT _c	= .	1.05F-08	mg/kg-day
Chemical Intake (non-carc. risk)	14 <u>02.</u>	=		mg/kg-day
NON-CARCINOGENIC RISK (Chronic Risk)				
Chemical Intake (non-carc. risk)	IT _{nc}	= :	2.96E-08	mg/kg-day
Reference dose		= 1.0	1.00E-02	mg/kg-day
Hazard Index	HI	=	2.96E-06	
CARCINOGENIC RISK				
Chemical Intake (carc. risk)	IT _c	=	1.05E-08	mg/kg-day
Slope factor (potency)	SF		a facility	1/(mg/kg-day)
Cancer Risk	Risk			pe Factor
			Age of the second	The state of the s

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Risk Calculations

Version: November 1999

Project Name: BRC Former Boeing C-6 Facility, Los Angeles, California

Chemical: Tetrachloroethylene (PCE)

Variable Descriptions Units

CALCULATION OF SOIL GAS CONCENTRATION

Ġ	Α.	SOU	RCE	· **	F	ee	Pr	odu	ct/Sc	oii>10	/0mg/	kg.

Mole fraction	MF	= 0.00E+00	dimensionless
Molecular weight	MW	= 1.70E+05	mg/mole
Vapor pressure	VP	= 2.43E-02	atm

Universal gas constant R = 8.20E-05 atm-m3/mole-K

Temperature T = 2.93E+02 K

Calculated soil gas concentration $C_{sg}(fp) = 0.00E+00 \text{ mg/m}^3$

B. SOURCE - Groundwater

Water contamination level $C_w = 2.50E+01 \text{ ug/l}$

Henry's Law Constant H = 7.50E-01 dimensionless

Calculated soil gas concentration $C_{sq}(gw) = 1.88E+01 \text{ mg/m}^3$

C. SOURCE - Soil < 100 mg/kg

Soil/water distribution coef. $K_d = 1.08E+00 \text{ cm}3/\text{gm}$ Calculated soil gas concentration $C_{sq}(s) = 0.00E+00 \text{ mg/m}3$

D. SOURCE - Measured Soil Gas

Measured soil gas concentration $C_{sg}(m) = mg/m3 (ug/l)$

E. SOIL GAS CONCENTRATION USED IN RISK CALCULATIONS >>>> 1.88E+01 mg/m3

<u>DIFFUSIVE TRANSPORT UPWARD IN UNSATURATED ZONE</u>

Calculated Flux	F _x	=	1.97E-03	mg/m2-hour
				m
Effective diffusion coefficient	De	=	5.78E-03	cm2/sec
Diffusion coefficient in air	D _a	=	7.20E-02	cm2/sec
Air-filled porosity	θ_a	= :	2.84E-01	dimensionless
Total porosity	θ	.=	4.34E-01	dimensionless

SITE ASSESSMENT & MITIGATION VAPOR RISK ASSESSMENT MODEL Risk Calculations

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ď	CALCUL	ATING \	APOR CON	CENTRATIO	ON IN BUILDING

A. INDOOR AIR COMPONENT				
Floor area of building	Α	=	9.68E+02	m 2
% of floor area that flux occurs			1.00E+00	dimensionless
Attenuation factor(Crack factor)	S _b	=	1.00E-02	dimensionless
Flux area within building	Af	=	9.68E+00	m2
Interior Height of building	R_h	$\dot{x}=\dot{x}^{-1}$	2.44E+00	m
Volume of building	Λ	= ::	2.36E+03	m3
Exchange rate of air	E	=; 1, 1,	8.30E-01	exchanges/hr
Ventilation rate	Q	= .	1.96E+03	m3/hr
Indoor air component	Ci	:=: [:] :	9.72E-06	mg/m3
B. OUTDOOR AIR COMPONENT				
Downwind contamination length		=		m
Wind speed	u	=		m/hr
Height of building openings	h	=	es de Million de terre Sets et l'Allianne et en	m
(or height of breathing zone)				
Outdoor air component	Co	= [0.00E+00	
C. TOTAL INDOOR AIR CONCENTRATION	Ct	=:-	9.72E-06	mg/m3
EXPOSURE SCENARIO				
Body weight		=	7.00E+01	
Inhalation rate	IR_	=	2.00E+01	
Exposure duration	ED	=	2.50E+01	
Hours per day	conversion		8.00E+00	
Exposure time	ΕT	=		hr/24 hours
Days per week	conversion			days/week
Weeks per year	conversion	100	5.00E+01	
Exposure frequency Averaging Time (carc. risk)		= :	1.25E+02 2.56E+04	
Averaging Time (carc. risk) Averaging Time (non-carc. risk)	er in the same of the end of the	- = 1	9.13E+03	
Averaging Time (non-carc. risk)			3.13L 103	uays
Chemical Intake (carc. risk)	ITc	<u> </u>	1.13F-07	mg/kg-day
Chemical Intake (non-carc. risk)	IT _{nc}	= .		mg/kg-day
	··nc			mg/kg day
NON-CARCINOGENIC RISK (Chronic Risk)				
Chemical Intake (non-carc. risk)	IT _{nc}	=	3.17E-07	mg/kg-day
Reference dose	RfD	=		mg/kg-day
Hazard Index	HI	= 1	3.17E-05	
CARCINOGENIC RISK	1 7			nateur jalanet. See alkalista
Chemical Intake (carc. risk)	IT _c	= .		mg/kg-day
Slope factor (potency)	SF	=	•	1/(mg/kg-day)
Cancer Risk	Risk	. = .	2.37E-09	

Risk Calculations

Version: November 1999

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Project Name: BRC Former Boeing C-6 Facility, Los Angeles, California

Chemical: 1,1,1-Trichloroethane (1,1,1-TCA)

Variable Descriptions Units

CALCULATION OF SOIL GAS CONCENTRATION

A. SOURCE - Free Product/Soil>100mg/kg.	
Mole fraction	MF = 0.00E+00 dimensionless
Molecular weight	MW = 1.30E+05 mg/mole
Vapor pressure	VP = 1.63E-01 atm
Universal gas constant	R = 8.20E-05 atm-m3/mole-K
	T 0.00E .00 K

Temperature T = 2.93E+02 K

Calculated soil gas concentration $C_{sq}(fp) = 0.00E+00 \text{ mg/m}^3$

B. SOURCE - Groundwater

Water contamination level $C_w = 2.20E+00 \text{ ug/l}$

Henry's Law Constant H = 7.10E-01 dimensionless

Calculated soil gas concentration $C_{sg}(gw) = 1.56E+00 \text{ mg/m}3$

C. SOURCE - Soil < 100 mg/kg

Soil contamination level C_t mg/kg Henry's Law Constant Н 7.10E-01 dimensionless Bulk density (dry) 1.50E+00 gm/cc $\rho_{\rm b}$ Air-filled porosity θ_a 2.84E-01 dimensionless Water-filled porosity $\theta_{\rm w}$ 1.50E-01 dimensionless Weight fraction of organic carbon f_{oc} 4.00E-03 dimensionless K_{oc} Organic carbon partition coefficient = 1.40E+02 cm3/gm K_{c} Soil/water distribution coef. 5.60E-01 cm3/gm Calculated soil gas concentration $C_{sq}(s)$ 0.00E+00 mg/m3

D. SOURCE - Measured Soil Gas

Measured soil gas concentration $C_{sg}(m) = mg/m3 (ug/l)$

E. SOIL GAS CONCENTRATION USED IN RISK CALCULATIONS >>>> 1.56E+00 mg/m3

<u>DIFFUSIVE TRANSPORT UPWARD IN UNSATURATED ZONE</u>

Total porosity	θ	$\lambda = \frac{1}{2} \left(\frac{1}{2} \right)^{\frac{1}{2}}$	4.34E-01	dimensionless
Air-filled porosity	θ_{a}	=	2.84E-01	dimensionless
Diffusion coefficient in air	D _a	= :	7.80E-02	cm2/sec
Effective diffusion coefficient	D _e	=	6.26E-03	cm2/sec
Depth of contamination or Csg				
Calculated Flux	F _x	:=:::	1.78E-04	mg/m2-hour

SITE ASSESSMENT & MITIGATION VAPOR RISK ASSESSMENT MODEL Risk Calculations

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j	CALCU	LAT	ING V	APOR	CONCENT	RATION	IN BUILDING	

A. INDOOR AIR COMPONENT			u u terre de titul tjete Guiterre de titul tjete	
Floor area of building	Α	= .	9.68E+02	m2
% of floor area that flux occurs			1.00E+00	dimensionless
Attenuation factor(Crack factor)	S_{b}	=	1.00E-02	dimensionless
Flux area within building	Af	= 1.	9.68E+00	m2
Interior Height of building	R _h	=	2.44E+00	m
Volume of building	ν	=: :	2.36E+03	m3
Exchange rate of air	E	=;	8.30E-01	exchanges/hr
Ventilation rate	Q	= 1.0	1.96E+03	m3/hr
Indoor air component	Ci	=: 1	8.78E-07	mg/m3
B. OUTDOOR AIR COMPONENT				
Downwind contamination length	L	= 1		m
Wind speed	u	=		m/hr
Height of building openings	h	= :		m
(or height of breathing zone)				
Outdoor air component	Co	= .	0.00E+00	mg/m3
C. TOTAL INDOOR AIR CONCENTRATION	Ct	= .	8.78E-07	mg/m3
EXPOSURE SCENARIO				
Body weight	and the second s		7.00E+01	
Inhalation rate	IR	= 1	2.00E+01	• • • • • • • • • • • • • • • • • • • •
Exposure duration	ED	= 1	2.50E+01	
Hours per day	conversion	100	8.00E+00	
Exposure time	·	=		hr/24 hours
Days per week	conversion	- 1 · .		days/week
Weeks per year	conversion		5.00E+01	•
Exposure frequency	EF		•	
Averaging Time (carc. risk)	AT AT	= .	2.56E+04 9.13E+03	
Averaging Time (non-carc. risk)	AI	_	3.13E±03	uays
Chemical Intake (carc. risk)	IT _c	=	1 02F-08	mg/kg-day
Chemical Intake (non-carc. risk)	IT _{nc}	=		mg/kg-day
	- nc		1.00L 00	mg/kg day
NON-CARCINOGENIC RISK (Chronic Risk)				
Chemical Intake (non-carc. risk)	IT _{nc}	= 1	2.86E-08	mg/kg-day
Reference dose	RfD	=		mg/kg-day
Hazard Index	HI	=""."		
Chemical Intelle (gare viels)	1T		1.000.00	والمراكم والمراس
Chemical Intake (carc. risk)				mg/kg-day
Slope factor (potency)	SF	100		1/(mg/kg-day)
Cancer Risk	Risk	<u> </u>	No Sic	pe Factor

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Risk Calculations Version: November 1999

Project Name: BRC Former Boeing C-6 Facility, Los Angeles, California

Chemical: 1,1,2 - TCA

Variable Descriptions Units

CALCULATION OF SOIL GAS CONCENTRATION

A. SOURCE - Free I	Product/Soil>100mg/kg.			
Mole fraction		MF = -	0.00E+00	dimensionless
Molecular weight		MW =	1.30E+05	mg/mole
Vapor pressure			3.10E-02	
Universal gas con	rstant	R =	8.20E-05	atm-m3/mole-K
Tomporatura			2.025.02	I Z

Temperature 2.93E+02 K

Calculated soil gas concentration C_{sq}(fp) 0.00E+00 mg/m3

B. SOURCE - Groundwater

 C_{w} Water contamination level = 4.30E+00 ug/l

Henry's Law Constant 3.70E-02 dimensionless H

Calculated soil gas concentration $C_{sg}(gw)$ 1.59E-01 mg/m3

C. SOURCE - Soil < 100 mg/kg

Soil contamination level C_{t} mg/kg 3.70E-02 dimensionless Henry's Law Constant Н Bulk density (dry) 1.50E+00 gm/cc $\rho_{\rm b}$ Air-filled porosity θ_a 2.84E-01 dimensionless Water-filled porosity $\theta_{\rm w}$ 1.50E-01 dimensionless Weight fraction of organic carbon f_{oc} 4.00E-03 dimensionless Koc Organic carbon partition coefficient = 7.50E+01 cm3/gm

Kd Soil/water distribution coef. 3.00E-01 cm3/gm Calculated soil gas concentration $C_{sq}(s)$ 0.00E+00 mg/m3

D. SOURCE - Measured Soil Gas

 $C_{sq}(m)$ Measured soil gas concentration mg/m3 (ug/l)

E. SOIL GAS CONCENTRATION USED IN RISK CALCULATIONS >>>> 1.59E-01 mg/m3

<u>DIFFUSIVE TRANSPORT UPWARD IN UNSATURATED ZONE</u>

Total porosity	θ	.=	4.34E-01	dimensionless
Air-filled porosity	θ_a	=	2.84E-01	dimensionless
Diffusion coefficient in air	D _a	=	7.80E-02	cm2/sec
Effective diffusion coefficient	D _e	=	6.26E-03	cm2/sec
Depth of contamination or Csg	X	= .	1.98E+01	m
Calculated Flux	F _x	$\dot{x} = \frac{1}{2} \left(\frac{1}{2} \right)^{\frac{1}{2}}$	1.81E-05	mg/m2-hour

SITE ASSESSMENT & MITIGATION VAPOR RISK ASSESSMENT MODEL Risk Calculations

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A. INDOOR AIR COMPONENT				
Floor area of building	Α	= .	9.68E+02	m2
% of floor area that flux occurs			1.00E+00	dimensionless
Attenuation factor(Crack factor)	$S_{\rm b}$	=	1.00E-02	dimensionless
Flux area within building	Af	=	9.68E+00	m2
Interior Height of building	R _h	=	2.44E+00	m
Volume of building	V.	=:	2.36E+03	m3
Exchange rate of air	E	= 1 1 1	8.30E-01	exchanges/hr
Ventilation rate	Q	= .	1.96E+03	m3/hr
Indoor air component	Ci	= .	8.94E-08	mg/m3
B. OUTDOOR AIR COMPONENT				
Downwind contamination length	La company de la company d	=		m
Wind speed	u	=		m/hr
Height of building openings	h	= :		m
(or height of breathing zone)				
Outdoor air component	Co	= ::	0.00E+00	mg/m3
C. TOTAL INDOOR AIR CONCENTRATION	Ct	=	8.94E-08	mg/m3
EXPOSURE SCENARIO				
Body weight		= .	7.00E+01	
Inhalation rate	IR	·=: .	2.00E+01	▼ 4.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4
Exposure duration	ED	=	2.50E+01	
Hours per day	conversion		8.00E+00	
Exposure time		=	A Company of the Comp	hr/24 hours
Days per week	conversion	4.7	a contract of the contract of	days/week
Weeks per year	conversion	1000	5.00E+01	
Exposure frequency		=	1.25E+02	
Averaging Time (carc. risk)	and the second second	=	2.56E+04	
Averaging Time (non-carc. risk)	AT	=	9.13E+03	days
Chamical Intelle Come visit	ITc	200	4 04E 00	manificat alays
Chemical Intake (carc. risk)	and a first section of the second	=		mg/kg-day
Chemical Intake (non-carc. risk)	IT _{nc}	=	2.92E-09	mg/kg-day
NON-CARCINOGENIC RISK (Chronic Risk)				
Chemical Intake (non-carc. risk)	IT _{nc}	=	2 02F_00	mg/kg-day
Reference dose	RfD			mg/kg-day
Hazard Index	HI		7.29E-07	mg/kg-day
CARCINOGENIC RISK				
Chemical Intake (carc. risk)	IT _c	=	1.04E-09	mg/kg-day
Slope factor (potency)	SF	= .	5.70E-02	1/(mg/kg-day)
Cancer Risk	Risk	:	5.92E-11	

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Version: November 1999

Project Name: BRC Former Boeing C-6 Facility, Los Angeles, California

Chemical: Trichloroethlyene (TCE)

Risk Calculations

Variable Descriptions Units

CALCULATION OF SOIL GAS CONCENTRATION

A. SOURCE - Free Product/Soil>100mg/kg.				
Mole fraction	MF	=	0.00E+00	dimensionless
Molecular weight	MW	=	1.30E+05	mg/mole
Vapor pressure	VP	=	7.61E-02	atm
Universal gas constant	R	= :::	8.20E-05	atm-m3/mole-K
Temperature	T	:	2.93E+02	K
Calculated soil gas concentration	C _{sg} (fp)	$\frac{1}{2} = \frac{1}{2} \cdot \frac{1}{2}$	0.00E+00	mg/m3
B. SOURCE - Groundwater				
Water contamination level	C _w	= :	3.60E+01	ug/l
Henry's Law Constant	Н	=	4.20E-01	dimensionless
Calculated soil gas concentration	C _{sg} (gw)	=	1.51E+01	mg/m3
C. SOURCE - Soil < 100 mg/kg				
Soil contamination level	C_{t}	:= : : : :	12. 1 2. 2. 1. 1. 2. 2 1. 1 - 1 2 2. 1. 1. 2 1.	mg/kg
Henry's Law Constant	H	=	4.20E-01	dimensionless
Bulk density (dry)	ρ_b	$\frac{1}{2} = \frac{1}{2} \cdot \frac{1}$	1.50E+00	gm/cc
Air-filled porosity	θ_{a}		2.84E-01	dimensionless
Water-filled porosity	θ_{w}	=	1.50E-01	dimensionless
Weight fraction of organic carbon	f _{oc}	=	4.00E-03	dimensionless
Organic carbon partition coefficient	K _{oc}	=	9.40E+01	cm3/gm
Soil/water distribution coef.	K _d	$\dot{x} = \dot{x}$	3.76E-01	cm3/gm
Calculated soil gas concentration	C _{sg} (s)	= :	0.00E+00	mg/m3
D. SOURCE - Measured Soil Gas				
Measured soil gas concentration	C _{sa} (m)	=		mg/m3 (ug/l)

E. SOIL GAS CONCENTRATION USED IN RISK CALCULATIONS >>>>

1.51E+01 mg/m3

Total porosity Air-filled porosity	Α		A CONTRACTOR OF THE PARTY OF TH	dimensionless dimensionless
Diffusion coefficient in air			11 .	A Company of the Comp
Effective diffusion coefficient				
Depth of contamination or Csg		and the second second	1.98E+01	
Calculated Flux	F _x	=	1.74E-03	mg/m2-hour

SITE ASSESSMENT & MITIGATION VAP	OR RISK AS	SSE	SSMENT MC	DEL
Risk Calculations				
CALCULATING VAPOR CONCENTRATION IN	I BIIII DING	· · · · · · · · · · · · · · · · · · ·		
A INDOOR AIR COMPONENT	4 DOILDING			
Floor area of building	Α	=	9.68E+02	m2
% of floor area that flux occurs	and the second s		1.00E+00	dimensionles
Attenuation factor(Crack factor)	S _b	=	1.00E-02	dimensionles
Flux area within building	Af	= :	9.68E+00	m2
Interior Height of building	R_h	=	2.44E+00	m
Volume of building	$\mathbf{v}^{"}$	=	2.36E+03	m3
Exchange rate of air	Ė	=	8.30E-01	exchanges/h
Ventilation rate	Q	=	1.96E+03	m3/hr
Indoor air component	C _i	=	8.60E-06	mg/m3
B. OUTDOOR AIR COMPONENT				
Downwind contamination length		=	u je 11 tore sa su servituje. Liji 11 tore sa severe se 11 s	m
Wind speed	u	=		m/hr
Height of building openings	h	=		m
(or height of breathing zone)				
Outdoor air component	Co	=	0.00E+00	mg/m3
C. TOTAL INDOOR AIR CONCENTRATION	Ct	=	8.60E-06	mg/m3
EXPOSURE SCENARIO				
Body weight	BW	= .	7.00E+01	kg
Inhalation rate	IR	=	2.00E+01	m3/day
Exposure duration	ED	=	2.50E+01	yrs
Hours per day	conversion		8.00E+00	hr/day
Exposure time	: ET:	=	3.33E-01	hr/24 hours
Days per week	conversion		2.50E+00	days/week
Weeks per year	conversion		5.00E+01	weeks/yr
Exposure frequency	: EF	f=0.016	1.25E+02	days/yr
Averaging Time (carc. risk)	AT	=	2.56E+04	days
Averaging Time (non-carc. risk)	AT	=	9.13E+03	days
Chemical Intake (carc. risk)	IT _c	=	1.00E-07	mg/kg-day
Chemical Intake (non-carc. risk)	IT _{nc}	$= \frac{1}{2} \left(\frac{1}{2} \right)^{\frac{1}{2}}$	2.81E-07	mg/kg-day
NON-CARCINOGENIC RISK (Chronic Risk)				
Chemical Intake (non-carc. risk)	IT _{nc}	=	2.81E-0	7 mg/kg-day
Reference dose	RfD	=	The state of the s	1 mg/kg-day
Hazard Index	HI	=	1.64E-0	
CARCINOGENIC RISK				
		areni.		ant (1 militaria) - Partino de Maria nto de Cartania (1 militaria)

 IT_{c}

SF

Risk

=

Chemical Intake (carc. risk)

Slope factor (potency)

Cancer Risk

1.00E-07 mg/kg-day

1.00E-09

1.00E-02 1/(mg/kg-day)

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Version: November 1999

Project Name: BRC Former Boeing C-6 Facility, Los Angeles, California

Chemical: n-butylbenzene

Risk Calculations

Variable Descriptions Units

CALCULATION OF SOIL GAS CONCENTRATION

A. SOURCE - Free Product/Soil>100mg/kg.				
Mole fraction	MF	= 1	0.00E+00	dimensionless
Molecular weight	MW	·. = · · ·	1.30E+05	mg/mole
Vapor pressure	VP	=	1.32E-03	atm
Universal gas constant	R	=	8.20E-05	atm-m3/mole-K
Temperature	T	=	2.93E+02	K
Calculated soil gas concentration	C _{sg} (fp)	= .	0.00E+00	mg/m3
B. SOURCE - Groundwater			turte escuele (follotte Textosecolos (follott	
Water contamination level	C _w	=	1.10E+02	ug/l
Henry's Law Constant	Н	= :	5.40E-01	dimensionless
Calculated soil gas concentration	$C_{sg}(gw)$	$\hat{x}_{i} = \hat{x}_{i} \hat{x}_{i}$	5.94E+01	mg/m3
C. SOURCE - Soil < 100 mg/kg				
Soil contamination level	Ct	=: :		mg/kg
Henry's Law Constant	Н	=	5.40E-01	dimensionless
Bulk density (dry)	ρ_b	=	1.50E+00	gm/cc
Air-filled porosity	θ_a	=	2.84E-01	dimensionless
Water-filled porosity	θ_{w}	=	1.50E-01	dimensionless
Weight fraction of organic carbon	f _{oc}	=	4.00E-03	dimensionless
Organic carbon partition coefficient	K _{oc}	=	2.80E+03	cm3/gm
Soil/water distribution coef.	K_d	=	1.12E+01	cm3/gm
Calculated soil gas concentration	C _{sg} (s)	=	0.00E+00	mg/m3
	** · · · · · · · · · · · · · · · · · ·			eli di santa
D. SOURCE - Measured Soil Gas				

E. SOIL GAS CONCENTRATION USED IN RISK CALCULATIONS >>>>

5.94E+01 mg/m3

	Calculated Flux	F _x	=	6.50E-03	mg/m2-hour
	Depth of contamination or Csg	Χ	=	1.98E+01	m
í.	Effective diffusion coefficient	D _e	=	6.02E-03	cm2/sec
	Diffusion coefficient in air	Da	=	7.50E-02	cm2/sec
	Air-filled porosity	θ_a	=	2.84E-01	dimensionless
	Total porosity				dimensionless

SITE ASSESSMENT	& MITIGATION	VAPOR RISK A	SSESSMENT	MODEL

Risk Calculations

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CALCULATING VAPOR CONCENTRATION IN	BUILDING			
A. INDOOR AIR COMPONENT				
Floor area of building	A ====================================	<u>=</u> ;	9.68E+02	m2
% of floor area that flux occurs			1.00E+00	dimensionless
Attenuation factor(Crack factor)	S _b =	:	1.00E-02	dimensionless
Flux area within building	Af =	=	9.68E+00	m2
Interior Height of building	R _h =	=	2.44E+00	m
Volume of building	V =	=	2.36E+03	m3
Exchange rate of air	: E	= -	8.30E-01	exchanges/hr
Ventilation rate	Q =	=	1.96E+03	m3/hr
Indoor air component	C _i =	=	3.21E-05	mg/m3
B. OUTDOOR AIR COMPONENT				
Downwind contamination length	- L =			m
Wind speed	=	=		m/hr
Height of building openings	h =			m
(or height of breathing zone)				
Outdoor air component	C o =	=	0.00E+00	mg/m3
C. TOTAL INDOOR AIR CONCENTRATION	C _t =		3.21E-05	mg/m3
EVECUEE CCENADIO				
EXPOSURE SCENARIO Body weight	BW =	1. 14 <u>.</u> . 14	7.00E+01	· · · · · · · · · · · · · · · · · · ·
Inhalation rate	IR =		2.00E+01	kg m3/day
Exposure duration	ED =		2.50E+01	yrs
Hours per day	conversion		8.00E+00	hr/day
Exposure time	ET =		3.33E-01	hr/24 hours
Days per week	conversion		2.50E+00	days/week
Weeks per year	conversion		5.00E+01	weeks/yr
Exposure frequency	_ EF =	<u>.</u>	1.25E+02	days/yr
Averaging Time (carc. risk)	AT ====================================	=	2.56E+04	days
Averaging Time (non-carc. risk)	AT =	=	9.13E+03	days
Chemical Intake (carc. risk)	IT _c =	=	3.73E-07	mg/kg-day
Chemical Intake (non-carc. risk)	IT _{nc} =	•	1.05E-06	mg/kg-day
NON-CARCINOGENIC RISK (Chronic Risk)				
	IT _{nc} =		1.05E.06	mg/kg-day
Chemical Intake (non-carc. risk) Reference dose	RfD =			mg/kg-day mg/kg-day
Hazard Index	HI =		1.05E-04	
			1.000-04	
CARCINOGENIC RISK				
Chemical Intake (carc. risk)	IT _c =		3.73E-07	mg/kg-day
Slope factor (potency)	SF	= 11 1 1	All the Artist Control of the Contro	1/(mg/kg-day)
Cancer Risk	Risk	= 1	No Slope F	
		1.55	1	

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Risk Calculations Version: November 1999

Project Name: BRC Former Boeing C-6 Facility, Los Angeles, California

Chemical: Ethylbenzene

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٠,	/ariable Descri	puons			Units

CALCULATION OF SOIL GAS CONCENTRATION

A. SOURCE - Free Product/Soil>100mg/kg.				
Mole fraction	MF	=	0.00E+00	dimensionless
Molecular weight	MW	. = · ·	1.10E+05	mg/mole
Vapor pressure	VP	$\underline{\boldsymbol{x}}_{i,j} = \underline{\boldsymbol{x}}_{i,j} \cdot \underline{\boldsymbol{x}}_{i,j}$	1.26E-02	atm
Universal gas constant	R	=	8.20E-05	atm-m3/mole-K
Temperature	T	=	2.93E+02	K
Calculated soil gas concentration	$C_{sg}(fp)$	=	0.00E+00	mg/m3
B. SOURCE - Groundwater				
Water contamination level	C _w	$\dot{x}_{ij} = \dot{x}_{ij} \dot{x}_{ij}$	8.20E+02	ug/l
Henry's Law Constant	Н	= .	3.20E-01	dimensionless
Calculated soil gas concentration	C _{sg} (gw)	= =	2.62E+02	mg/m3
C. SOURCE - Soil < 100 mg/kg				
Soil contamination level	Ct	=		mg/kg
Henry's Law Constant	Н	=	3.20E-01	dimensionless
Bulk density (dry)	ρ_b	=	1.50E+00	gm/cc
Air-filled porosity	θ_{a}	=	2.84E-01	dimensionless
Water-filled porosity	$\theta_{\rm w}$	=	1.50E-01	dimensionless
Weight fraction of organic carbon	f _{oc}		4.00E-03	dimensionless
Organic carbon partition coefficient	K _{oc}	=	2.00E+02	cm3/gm
Soil/water distribution coef.	K _d	= **	8.00E-01	cm3/gm
Calculated soil gas concentration	C _{sq} (s)	=	0.00E+00	mg/m3
D. SOURCE - Measured Soil Gas			[]	
Measured soil gas concentration	C _{sq} (m)	=		mg/m3 (ug/l)

E. SOIL GAS CONCENTRATION USED IN RISK CALCULATIONS >>>>

2.62E+02 mg/m3

Total porosity	θ	_ =	4.34E-01	dimensionless
Air-filled porosity	$ heta_{a}$	= -	2.84E-01	dimensionless
Diffusion coefficient in air		=	7.50E-02	cm2/sec
Effective diffusion coefficient			6.02E-03	cm2/sec
Depth of contamination or Csg	X	$A_{ij}^{(i)} = \frac{1}{2} A_{ij}^{(i)} A_{ij}^{(i)} A_{ij}^{(i)}$	1.98E+01	m
Calculated Flux	F _x		2.87E-02	mg/m2-hour

SITE ASSESSMENT	& MITIGATION	VAPOR RISK	ASSESSMENT	MODEL
Risk Calculations			·	·

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CALCULATING VAPOR CONCENTRATION IN	BUILDING			
A. INDOOR AIR COMPONENT				
Floor area of building	Α	` = `	9.68E+02	m2
% of floor area that flux occurs			1.00E+00	dimensionless
Attenuation factor(Crack factor)	S _b	=	1.00E-02	dimensionless
Flux area within building	Af	= .	9.68E+00	m2
Interior Height of building	R_h	=: ::::::::::::::::::::::::::::::::::::	2.44E+00	m
Volume of building	V	=	2.36E+03	m3
Exchange rate of air	E	=	8.30E-01	exchanges/hr
Ventilation rate	Q	=	1.96E+03	m3/hr
Indoor air component	Ci	=	1.42E-04	mg/m3
B. OUTDOOR AIR COMPONENT				
Downwind contamination length	L	=		m
Wind speed	u	=		m/hr
Height of building openings	h	=		m
(or height of breathing zone)				
Outdoor air component	Co	=	0.00E+00	mg/m3
C. TOTAL INDOOR AIR CONCENTRATION	Ct	=	1.42E-04	mg/m3
i transministra (j. 1. j. 1. j. Transministra stolenska stalina stalina stalina stalina stalina i 1. j. 1.				
EXPOSURE SCENARIO				
Body weight	BW	=	7.00E+01	kg
Inhalation rate	IR	=	2.00E+01	m3/day
Exposure duration	ED	=	2.50E+01	yrs
Hours per day	conversion		8.00E+00	hr/day
Exposure time	ET	=	3.33E-01	hr/24 hours
Days per week	conversion	And the second	2.50E+00	days/week
Weeks per year	conversion	1000	5.00E+01 1.25E+02	weeks/yr
Exposure frequency Averaging Time (carc. risk)	EF AT	=	2.56E+04	days/yr days
Averaging Time (carc. risk) Averaging Time (non-carc. risk)	AT	. -	9.13E+03	days
Averaging Time (non-carc. risk)	^!		9.13E103	uays
Chemical Intake (carc. risk)	IT _e	=	1.65E-06	mg/kg-day
Chemical Intake (non-carc. risk)	IT _{nc}	=	4.62E-06	mg/kg-day
	116			99,
NON-CARCINOGENIC RISK (Chronic Risk)				
Chemical Intake (non-carc. risk)	IT _{nc}	\equiv	4.62E-06	mg/kg-day
Reference dose	RfD	=		mg/kg-day
Hazard Index	HI	=	8.09E-06	
CARCINOGENIC RISK				
Chemical Intake (carc. risk)	IT _c	=	1.65E-06	mg/kg-day
Slope factor (potency)	SF		The state of the s	1/(mg/kg-day)
Cancer Risk	Risk		No Slope F	, , ,
	IZION	–	No Slope r	actor

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Risk Calculations Version: November 1999

Project Name: BRC Former Boeing C-6 Facility, Los Angeles, California

Chemical: n-propylbenzene

Variable Descriptions Units

CALCULATION OF SOIL GAS CONCENTRATION

CALCULATION OF SOIL GAS CONCENTRATE	<u>VIV</u>			
A. SOURCE - Free Product/Soil>100mg/kg.				
Mole fraction	MF	=	0.00E+00	dimensionless
Molecular weight	MW	= -	1.20E+05	mg/mole
Vapor pressure	VP	=:	1.32E-03	atm
Universal gas constant	R	. =	8.20E-05	atm-m3/mole-K
Temperature	T	=	2.93E+02	K
Calculated soil gas concentration	C _{sg} (fp)	=	0.00E+00	mg/m3
B. SOURCE - Groundwater				
Water contamination level	C _w	=	9.00E+01	ug/l
Henry's Law Constant	Н	= :	5.40E-01	dimensionless
Calculated soil gas concentration	C _{sg} (gw)	=	4.86E+01	mg/m3
C. SOURCE - Soil < 100 mg/kg				
Soil contamination level	Ct	=		mg/kg
Henry's Law Constant	Н	= =	5.40E-01	dimensionless
Bulk density (dry)	$ ho_b$	=	1.50E+00	gm/cc
Air-filled porosity	θ_{a}	=	2.84E-01	dimensionless
Water-filled porosity	$\theta_{\rm w}$	=	1.50E-01	dimensionless
Weight fraction of organic carbon	f _{oc}	≐	4.00E-03	dimensionless
Organic carbon partition coefficient	K _{oc}	= :	2.80E+03	cm3/gm
Soil/water distribution coef.	K_d	=	1.12E+01	cm3/gm
Calculated soil gas concentration	C _{sg} (s)	=	0.00E+00	mg/m3
D. SOURCE - Measured Soil Gas				
Measured soil gas concentration	C _{sg} (m)	=	, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,	mg/m3 (ug/l)

E. SOIL GAS CONCENTRATION USED IN RISK CALCULATIONS >>>>

4.86E+01 mg/m3

	Calculated Flux	F _x	= 5.32E	-03 mg/m2-ho	ur
÷	Depth of contamination or Csg		= 1.98E+		
í.	Effective diffusion coefficient	D _e	= 6.02E-	03 cm2/sec	ļ.
	Diffusion coefficient in air	D _a	= 7.50E-	02 cm2/sec	
	Air-filled porosity		and the second of the second o	01 dimensionI	
	Total porosity	θ	and the second s	01 dimensionl	

SITE ASSESSMENT	& MITIGATION VAPOR	R RISK ASSESSMENT	MODEL
Risk Calculations			

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CALCULATING VAPOR CONCENTRATION IN	BUILDING			
A. INDOOR AIR COMPONENT				
Floor area of building	Α	`≡:	9.68E+02	m2
% of floor area that flux occurs			1.00E+00	dimensionless
Attenuation factor(Crack factor)	S_b	=:	1.00E-02	dimensionless
Flux area within building	Af	=	9.68E+00	m2
Interior Height of building	R_h	=::::::::::::::::::::::::::::::::::::::	2.44E+00	m
Volume of building	V	= -	2.36E+03	m3
Exchange rate of air	E	= ' ' ' '	8.30E-01	exchanges/hr
Ventilation rate	Q	=	1.96E+03	m3/hr
Indoor air component	Ci	=	2.63E-05	mg/m3
B. OUTDOOR AIR COMPONENT				
Downwind contamination length	L	=		m
Wind speed	u	=		m/hr
Height of building openings	h	=		(m
(or height of breathing zone)				
Outdoor air component	Co	=	0.00E+00	mg/m3
C. TOTAL INDOOR AIR CONCENTRATION	Ct	= 1	2.63E-05	mg/m3
EXPOSURE SCENARIO				
Body weight	BW	= -	7.00E+01	kġ
Inhalation rate	IR	=	2.00E+01	m3/day
Exposure duration	ED	= 1	2.50E+01	yrs
Hours per day	conversion		8.00E+00	hr/day
Exposure time	ET	=:	3.33E-01	hr/24 hours
Days per week	conversion	and the second	2.50E+00	days/week
Weeks per year	conversion		5.00E+01	weeks/yr
Exposure frequency	—	=	1.25E+02	days/yr
Averaging Time (carc. risk)	AT	=	2.56E+04	days
Averaging Time (non-carc. risk)	AT		9.13E+03	days
andriae (1997), and a filter and a second and a second and a filter and a filter and a filter and a second and The filter and the filter and the filter and a second and a second and a filter and a filter and a second and a			randa (m. 1919). Manaza (m. 1919).	
Chemical Intake (carc. risk)	IT _c	:=:	3.05E-07	mg/kg-day
Chemical Intake (non-carc. risk)	IT _{nc}	= 1	8.56E-07	mg/kg-day
ra di Mariana. A di Amerika da Mariana da Ma Na kalangan manga za kalangan da mangan da kanangan da Mariana da Mariana da Mariana da Mariana da Mariana da M				
NON-CARCINOGENIC RISK (Chronic Risk)				
Chemical Intake (non-carc. risk)	IT _{nc}	=	The second secon	mg/kg-day
Reference dose	RfD		The state of the s	mg/kg-day
Hazard Index	HI	:=	8.56E-05	
CARCINOGENIC RISK				
Chemical Intake (carc. risk)	$IT_{\mathbf{c}}$		3 05F-07	mg/kg-day
Slope factor (potency)	.∵c SF		1000	1/(mg/kg-day)
Cancer Risk	Risk	— -	No Slope F	
Valicei Nisk	ЛСІЛ		Mo Slohe L	actor

Version: November 1999

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Project Name: BRC Former Boeing C-6 Facility, Los Angeles, California

Chemical: 1,2,4 - Trimethylbenzene

Measured soil gas concentration

Variable Descriptions				Units
CALCULATION OF SOIL GAS CONCENTRAT	ION			
A. SOURCE - Free Product/Soil>100mg/kg.	<u></u>			
Mole fraction	MF	=	0.00E+00	dimensionless
Molecular weight	MW	$\dot{x}_{ij} = \dot{x}_{ij} \dot{x}_{ij}$	1.20E+05	mg/mole
Vapor pressure	VP	=	2.76E-03	atm
Universal gas constant	R	-=	8.20E-05	atm-m3/mole-K
Temperature	T	$\boldsymbol{x}_{i}=\boldsymbol{x}_{i}\cdot\boldsymbol{x}_{i}$	2.93E+02	K
Calculated soil gas concentration	C _{sg} (fp)	= :	0.00E+00	mg/m3
B. SOURCE - Groundwater				
Water contamination level	C _w	=	1.30E+03	ug/l
Henry's Law Constant	Н	$\boldsymbol{x}^{t} = \boldsymbol{y}^{t} \cdot \boldsymbol{x}^{t}$	2.30E-01	dimensionless
Calculated soil gas concentration	C _{sg} (gw)	=	2.99E+02	mg/m3
C. SOURCE - Soil < 100 mg/kg				
Soil contamination level	Ct	$\underline{\underline{}} = \underline{\underline{}}$		mg/kg
Henry's Law Constant	Н	=:-	2.30E-01	dimensionless
Bulk density (dry)	ρ_b	=	1.50E+00	gm/cc
Air-filled porosity	θ_a	= .	2.84E-01	dimensionless
Water-filled porosity	θ_{w}	=	1.50E-01	dimensionless
Weight fraction of organic carbon	f _{oc}	=	4.00E-03	dimensionless
Organic carbon partition coefficient	Koc	=	3.70E+03	cm3/gm
Organic carbon partition coemolent	. 00			
Soil/water distribution coef.	K _d	=	1.48E+01	cm3/gm
		= ::	1.48E+01 0.00E+00	cm3/gm mg/m3

E. SOIL GAS CONCENTRATION USED IN RISK CALCULATIONS >>>>

2.99E+02 mg/m3

mg/m3 (ug/l)

DIFFUSIVE TRANSPORT UPWARD IN UNS	SATURATE	ED ZONE		
Total porosity	θ	=	4.34E-01	dimensionless
Air-filled porosity	θ_a		2.84E-01	dimensionless
Diffusion coefficient in air	D _a		7.50E-02	cm2/sec
Effective diffusion coefficient				
Depth of contamination or Csg			1.98E+01	
Calculated Flux	F _x	=	3.27E-02	mg/m2-hour
and the control of th	and the second second	and the second second second	and the second second	A Property of the Control of the Con

C_{sq}(m)

 SITE ASSESSMENT & MITIGATION VAPOR RISK ASSESSMENT MODEL	Page 2-2
 Risk Calculations	Version: November 1999
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CALCULATING VAPOR CONCENTRATION IN	BUILDING			
A. INDOOR AIR COMPONENT				
Floor area of building	Α	=	9.68E+02	m2
% of floor area that flux occurs			1.00E+00	dimensionless
Attenuation factor(Crack factor)	S _b	=	1.00E-02	dimensionless
Flux area within building	Af	=	9.68E+00	m2
Interior Height of building	R_h	=	2.44E+00	m
Volume of building	V	$= \frac{1}{2} \left(\frac{1}{2} \right)^{\frac{1}{2}} \left(\frac{1}{2} \right)^{\frac{1}{2}}$	2.36E+03	m3
Exchange rate of air	E	=	8.30E-01	exchanges/hr
Ventilation rate	Q	= 1 1 1 1 1	1.96E+03	m3/hr
Indoor air component	Ci	=	1.62E-04	mg/m3
B. OUTDOOR AIR COMPONENT				
Downwind contamination length	L	=		m
Wind speed	u	=		m/hr
Height of building openings	h	=		m
(or height of breathing zone)				
Outdoor air component	Co	=	0.00E+00	mg/m3
C. TOTAL INDOOR AIR CONCENTRATION	Ct	=	1.62E-04	mg/m3
Source State Source Source B. B. Source Source, Source Source P. B 44, Book B. Noder,				
EXPOSURE SCENARIO	BW	<u></u>	7.005.04	10 mg
Body weight Inhalation rate	IR	=	7.00E+01 2.00E+01	kg m3/day
Exposure duration	ED		2.50E+01	yrs
Hours per day	conversion		8.00E+00	hr/day
Exposure time	FT	=	3.33E-01	hr/24 hours
Days per week	conversion		2.50E+00	days/week
Weeks per year	conversion	ALC: The second	5.00E+01	weeks/yr
Exposure frequency	EF	=	1.25E+02	days/yr
Averaging Time (carc. risk)	AT	=	2.56E+04	days
Averaging Time (non-carc. risk)	AT	=0.011111111111111111111111111111111111	9.13E+03	days
Chemical Intake (carc. risk)	IT _c	=	1.88E-06	mg/kg-day
Chemical Intake (non-carc. risk)	IT _{nc}	=	5.27E-06	mg/kg-day
NON-CARCINOGENIC RISK (Chronic Risk)	-		E 07E 00	
Chemical Intake (non-carc. risk)	IT _{nc}	=		mg/kg-day
Reference dose	RfD	=	and the second control of the second control	mg/kg-day
Hazard Index	HI	_	3.10E-03	
CARCINOGENIC RISK				
Chemical Intake (carc. risk)	IT _c	_	1.88F-06	mg/kg-day
Slope factor (potency)	SF	=		1/(mg/kg-day)
Cancer Risk	Risk	_	No Slope I	
			.to Slope i	40101

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Risk Calculations Version: November 1999

Project Name: BRC Former Boeing C-6 Facility, Los Angeles, California

Chemical: 1,3,5 - Trimethylbenzene

 A function for the product of the control 	and the second s		and the contract of the contra
Variable Descriptions	The state of the second section is a section of the second section of the second section is a second section of the second section is a second second section of the second section is a second section of the section of the second section of the section of the second section of the sectio	Market and the second of the second of the second	Units

CALCULATION OF SOIL GAS CONCENTRATION

A. SOURCE - Free Product/Soil>100mg/kg	•			
Mole fraction	MF	=	0.00E+00	dimensionless
Molecular weight	MW	=	1.20E+05	mg/mole
Vapor pressure	VP	=	3.26E-03	atm
Universal gas constant	R	= .	8.20E-05	atm-m3/mole-K
Temperature	T	=	2.93E+02	K
Calculated soil gas concentration	C _{sg} (fp)	-	0.00E+00	mg/m3
B. SOURCE - Groundwater				
Water contamination level	C_{w}	=	1.40E+03	ug/l
Henry's Law Constant	Н	=::::	3.20E-01	dimensionless
Calculated soil gas concentration	C _{sg} (gw)	= :	4.48E+02	mg/m3
C. SOURCE - Soil < 100 mg/kg				
Soil contamination level	$\mathbf{C}_{\mathbf{t}}$	= :		mg/kg
Henry's Law Constant	Н	=	3.20E-01	dimensionless
Bulk density (dry)	ρ_b	=	1.50E+00	gm/cc
Air-filled porosity	θ_{a}		2.84E-01	dimensionless
Water-filled porosity	$\theta_{\mathbf{w}}$	= -	1.50E-01	dimensionless
Weight fraction of organic carbon	f _{oc}	= ::	4.00E-03	dimensionless
Organic carbon partition coefficient	K _{oc}	= :::	8.20E+02	cm3/gm
Soil/water distribution coef.	K_d	=	3.28E+00	cm3/gm
Calculated soil gas concentration	C _{sg} (s)	= =	0.00E+00	mg/m3
D. SOURCE - Measured Soil Gas				
Measured soil gas concentration	C _{sa} (m)	=	To the second	mg/m3 (ug/l)

E. SOIL GAS CONCENTRATION USED IN RISK CALCULATIONS >>>>

4.48E+02 mg/m3

Calculated Flux		=	4.90E-02	mg/m2-hour
Depth of contamination or Csg	X	=	1.98E+01	m
Effective diffusion coefficient	D _e	=	6.02E-03	cm2/sec
Diffusion coefficient in air			7.50E-02	
Air-filled porosity	θ_a	=	2.84E-01	dimensionless
Total porosity				dimensionless

SITE ASSESSMENT &	MITIGATION V	APOR RISK A	SSESSMENT	MODEL
Risk Calculations				

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CALCULATING VAPOR CONCENTRATION IN	BUILDING			
A. INDOOR AIR COMPONENT		·		
Floor area of building	Α	` ' ≡'	9.68E+02	m2
% of floor area that flux occurs			1.00E+00	dimensionless
Attenuation factor(Crack factor)	S _b	=	1.00E-02	dimensionless
Flux area within building	Af	=	9.68E+00	m2
Interior Height of building	R_h	=: ::::::::::::::::::::::::::::::::::::	2.44E+00	m
Volume of building	V	=	2.36E+03	m3
Exchange rate of air	E	= -	8.30E-01	exchanges/hr
Ventilation rate	Q	=	1.96E+03	m3/hr
Indoor air component	Ci	=	2.42E-04	mg/m3
B. OUTDOOR AIR COMPONENT				
Downwind contamination length	L	=	otennen en et et en	m
Wind speed	u	=		m/hr
Height of building openings	h	=		m
(or height of breathing zone)				
Outdoor air component	Co	=	0.00E+00	mg/m3
C. TOTAL INDOOR AIR CONCENTRATION	Ct	=	2.42E-04	mg/m3
EXPOSURE SCENARIO				
Body weight	BW	= :::	7.00E+01	kg
Inhalation rate	IR	=	2.00E+01	m3/day
Exposure duration	ED	= 1 1 1 1	2.50E+01	yrs
Hours per day	conversion		8.00E+00	hr/day
Exposure time	ET	=	3.33E-01	hr/24 hours
Days per week	conversion	100	2.50E+00	days/week
Weeks per year	conversion	and the first of	5.00E+01	weeks/yr
Exposure frequency	EF	=	1.25E+02	days/yr
Averaging Time (carc. risk)	AT	=	2.56E+04	days
Averaging Time (non-carc. risk)	AT	=	9.13E+03	days
Observation learning /page wints	ITc	=	2.81E-06	and the day.
Chemical Intake (carc. risk)	and the second second		of the second second	mg/kg-day
Chemical Intake (non-carc. risk)	IT _{nc}	=	7.89E-06	mg/kg-day
NON-CARCINOGENIC RISK (Chronic Risk)				
Chemical Intake (non-carc. risk)	IT _{nc}	=	7.89E-06	mg/kg-day
Reference dose	RfD	=	or firm and the second of the	mg/kg-day
Hazard Index	HI	=	4.64E-03	
CARCINOGENIC RISK				
Chemical Intake (carc. risk)	$IT_{\mathbf{c}}$	=	2.81E-06	mg/kg-day
Slope factor (potency)	SF	=	and the second second	1/(mg/kg-day)
Cancer Risk	Risk	=	No Slope F	

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Version: November 1999

Project Name: BRC Former Boeing C-6 Facility, Los Angeles, California

Chemical: Toluene

Risk Calculations

Variable Descriptions Units

CALCULATION OF SOIL GAS CONCENTRATION

A. SOURCE - Free Product/Soil>100mg/kg.				
Mole fraction	MF	= = :::	0.00E+00	dimensionless
Molecular weight	MW	=	9.20E+04	mg/mole
Vapor pressure	VP	= :	3.74E-02	atm
Universal gas constant	R	=	8.20E-05	atm-m3/mole-K
Temperature	T	=	2.93E+02	· · K
Calculated soil gas concentration	C _{sg} (fp)	=	0.00E+00	mg/m3
B. SOURCE - Groundwater				
Water contamination level	C _w	=	1.30E+02	ug/l
Henry's Law Constant	Н	= -	2.70E-01	dimensionless
Calculated soil gas concentration	C _{sg} (gw)	. = :	3.51E+01	mg/m3
C. SOURCE - Soil < 100 mg/kg				
Soil contamination level	Ct	=		mg/kg
Henry's Law Constant	Н	=	2.70E-01	dimensionless
Bulk density (dry)	ρ_{b}		1.50E+00	gm/cc
Air-filled porosity	θ_{a}	=	2.84E-01	dimensionless
Water-filled porosity	$\theta_{\rm w}$	=	1.50E-01	dimensionless
Weight fraction of organic carbon	f _{oc}	=	4.00E-03	dimensionless
Organic carbon partition coefficient	K _{oc}	= 1	1.40E+02	cm3/gm
Soil/water distribution coef.	K _d	=	5.60E-01	cm3/gm
Calculated soil gas concentration	C _{sg} (s)	=	0.00E+00	mg/m3
D. SOURCE - Measured Soil Gas				
Measured soil gas concentration	C _{sq} (m)	= :		mg/m3 (ug/l)

E. SOIL GAS CONCENTRATION USED IN RISK CALCULATIONS >>>>

3.51E+01 mg/m3

Calculated Flux	F _x	=====	4.45E-03	mg/m2-hour
Depth of contamination or Csg				the contract of the contract o
Effective diffusion coefficient				
Diffusion coefficient in air	Da	:::::: = :::::::::::::::::::::::::::::	8.70E-02	cm2/sec
Air-filled porosity	θ_a	=::::	2.84E-01	dimensionless
Total porosity	θ	and a second control of the second		dimensionless

SITE ASSESSMENT	& MITIGATION	VAPOR RISK A	SSESSMENT	MODEL

Risk Calculations

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CALCULATING VAPOR CONCENTRATION IN I	BUILDING			
A. INDOOR AIR COMPONENT				
Floor area of building	Α	` = `	9.68E+02	m2
% of floor area that flux occurs			1.00E+00	dimensionless
Attenuation factor(Crack factor)	S _b	=	1.00E-02	dimensionless
Flux area within building	Af	= .	9.68E+00	m2
Interior Height of building	R_h	=	2.44E+00	m
Volume of building	V	=	2.36E+03	m3
Exchange rate of air	E	=	8.30E-01	exchanges/hr
Ventilation rate	Q	=	1.96E+03	m3/hr
Indoor air component	Ci	=	2.20E-05	mg/m3
B. OUTDOOR AIR COMPONENT				
Downwind contamination length	L			m
Wind speed	u	=		m/hr
Height of building openings	h	$i=1,\dots, n$		(m)
(or height of breathing zone)				
Outdoor air component	Co	=	0.00E+00	mg/m3
C. TOTAL INDOOR AIR CONCENTRATION	C_t	=	2.20E-05	mg/m3
		aaan leena aaan ahaa		
EXPOSURE SCENARIO				
Body weight	BW	=	7.00E+01	kg
Inhalation rate	IR	=	2.00E+01	m3/day
Exposure duration	ED	=	2.50E+01	yrs
Hours per day	conversion		8.00E+00	hr/day
Exposure time	ET		3.33E-01	hr/24 hours
Days per week	conversion	the first of the first	2.50E+00	days/week
Weeks per year	conversion	111	5.00E+01	weeks/yr
Exposure frequency	EF	=	1.25E+02	days/yr
Averaging Time (carc. risk)	AT	=	2.56E+04	days
Averaging Time (non-carc. risk)	AT	=	9.13E+03	days
Chemical Intake (carc. risk)	IT _c		2.56E-07	mg/kg-day
Chemical Intake (carc. risk)	IT _{nc}		7.17E-07	mg/kg-day
Chemical intake (non-carc. risk)	" nc	_	7.17E-07	mg/kg-day
NON-CARCINOGENIC RISK (Chronic Risk)				
Chemical Intake (non-carc. risk)	IT _{nc}	=	7 17F-07	mg/kg-day
Reference dose	RfD	=		mg/kg-day
Hazard Index	HI	=	8.37E-06	
			0.07 E-00	
CARCINOGENIC RISK				
Chemical Intake (carc. risk)	ITc	=	2.56E-07	mg/kg-day
Slope factor (potency)	SF		t to the second	1/(mg/kg-day)
Cancer Risk	Risk	=	No Slope F	

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Version: November 1999

Project Name: BRC Former Boeing C-6 Facility, Los Angeles, California

Chemical: Xylenes

Risk Calculations

Variable Descriptions Units

CALCULATION OF SOIL GAS CONCENTRATION

A. SOURCE - Free Product/Soil>100mg/kg.				
Mole fraction	MF	=	0.00E+00	dimensionless
Molecular weight	MW	=	1.10E+05	mg/mole
Vapor pressure	VP	$A^{-1}=A^{-1}$	1.05E-02	atm
Universal gas constant	R	:	8.20E-05	atm-m3/mole-K
Temperature	T	=	2.93E+02	· K
Calculated soil gas concentration	C _{sg} (fp)	=	0.00E+00	mg/m3
B. SOURCE - Groundwater				
Water contamination level	C_{w}	=	4.70E+03	ug/l
Henry's Law Constant	Н	=	3.00E-01	dimensionless
Calculated soil gas concentration	$C_{sg}(gw)$	=	1.41E+03	mg/m3
C. SOURCE - Soil < 100 mg/kg				
Soil contamination level	C_{t}			mg/kg
Henry's Law Constant	Н	. := : : : : :	3.00E-01	dimensionless
Bulk density (dry)	ρ_{b}	$A_{ij} = A_{ij} A_{ij}$	1.50E+00	gm/cc
A to difficult section with a				* - T
Air-filled porosity	θ_a	=	2.84E-01	dimensionless
Water-filled porosity	$ heta_{a}$ $ heta_{w}$	= :	2.84E-01 1.50E-01	dimensionless dimensionless
			et in the state of the	
Water-filled porosity	θ_{w}	=	1.50E-01	dimensionless
Water-filled porosity Weight fraction of organic carbon	$ heta_{ m w}$ $ heta_{ m oc}$		1.50E-01 4.00E-03	dimensionless dimensionless
Water-filled porosity Weight fraction of organic carbon Organic carbon partition coefficient	θ _w f _{oc} K _{oc}		1.50E-01 4.00E-03 2.00E+02	dimensionless dimensionless cm3/gm
Water-filled porosity Weight fraction of organic carbon Organic carbon partition coefficient Soil/water distribution coef.	θ _w f _{oc} K _{oc} K _d		1.50E-01 4.00E-03 2.00E+02 8.00E-01	dimensionless dimensionless cm3/gm cm3/gm

E. SOIL GAS CONCENTRATION USED IN RISK CALCULATIONS >>>>

1.41E+03 mg/m3

Calculated Flux	F _x	= 1.44	E-01 mg/m2-	hour
Depth of contamination or Csg		= 1.981		
Effective diffusion coefficient	D _e	= 5.62	E-03 cm2/sec	:
Diffusion coefficient in air		A CONTRACTOR OF THE PARTY OF TH	E-02 cm2/sec	
Air-filled porosity	θ_{a}	= 2.84	E-01 dimensi	onless
Total porosity	θ.	ere ere ere og av er et flygt i det ere ere er	E-01 dimensi	

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CALCULATING VAPOR CONCENTRATION IN	BUILDING			
A. INDOOR AIR COMPONENT				
Floor area of building	Α	` ' ≡'	9.68E+02	m2
% of floor area that flux occurs			1.00E+00	dimensionless
Attenuation factor(Crack factor)	S _b	=	1.00E-02	dimensionless
Flux area within building	Af	=	9.68E+00	m2
Interior Height of building	R_h	$\dot{x}=\dot{x}_{1}\dot{x}_{2}\dot{x}_{3}\dot{x}_{4}\dot{x}_{2}\dot{x}_{3}\dot{x}_{3}\dot{x}_{4}\dot{x}_{5$	2.44E+00	m
Volume of building	V	=	2.36E+03	m3
Exchange rate of air	E	=	8.30E-01	exchanges/hr
Ventilation rate	Q	`` ≐ }:::::	1.96E+03	.m3/hr
Indoor air component	Ci	=	7.11E-04	mg/m3
B. OUTDOOR AIR COMPONENT				
Downwind contamination length	L	=		m
Wind speed	u	=		m/hr
Height of building openings	h	=		m
(or height of breathing zone)				
Outdoor air component	Co	=	0.00E+00	mg/m3
C. TOTAL INDOOR AIR CONCENTRATION	Ct	=	7.11E-04	mg/m3
EVECCUE CCEMADIO				
EXPOSURE SCENARIO	BW	: <u></u> :	7.005.03	12.2
Body weight Inhalation rate	IR	=	7.00E+01 2.00E+01	kg m3/day
Exposure duration	ED	. -	2.50E+01	yrs
Hours per day	conversion		8.00E+00	hr/day
Exposure time	ET	·	3.33E-01	hr/24 hours
Days per week	conversion	r Landana Paratanana	2.50E+00	days/week
Weeks per year	conversion	1000	5.00E+01	weeks/yr
Exposure frequency	EF		1.25E+02	days/yr
Averaging Time (carc. risk)	AT	=	2.56E+04	days
Averaging Time (non-carc. risk)	AT	=	9.13E+03	days
Chemical Intake (carc. risk)	ITc	=	8.26E-06	mg/kg-day
Chemical Intake (non-carc. risk)	IT _{nc}	=	2.32E-05	mg/kg-day
NON-CARCINOGENIC RISK (Chronic Risk)				
Chemical Intake (non-carc. risk)	IT _{nc}	=	2 32F-05	mg/kg-day
Reference dose	RfD			mg/kg-day
Hazard Index	HI	=	1.16E-04	
OADOMOOFNIO DIOIZ				
CARCINOGENIC RISK	IΤ		0.00=.00	rteer verneer van de seel van de seel verde verde van de seel van de seel verde verde verde verde verde verde v Note tot de seel van de seel verde verd
Chemical Intake (carc. risk)	ΙΤ _c		And the second second	mg/kg-day
Slope factor (potency)	SF	. =		1/(mg/kg-day)
Cancer Risk	Risk	= : :	No Slope I	-actor

CHEMICAL PARAMETERS

			_					Water	T	Chronic RfD
	MW	H'	Da	VP	Temp.		K _{oc}	Solubility	CSF (inh)	(inh)
	(mg/mole)	(dimension- less)	(cm²/sec)	(atm)	(°C)		(cm³/g)	(mg/L-water)	(mg/kg-day) ⁻¹	(mg/kg-day)
CAS No.										
127-18-4 Tetrachloroethylene (PCE)	1.7E+05 a	7.5E-01 a	7.2E-02 a	2.4E-02	25	ь	2.7E+02 a	2.0E+02 a	2.1E-02 c	1.0E-02 e
75-09-2 Methylene Chloride	8.5E+04 a	9.0E-02 a	1.0E-01 a	5.7E-01	25	b	1.0E+01 a	1.3E+04 a	3.5E-03 c	1.1E-01 e
67-66-3 Chloroform	1.2E+05 a	1.5E-01 a	1.0E-01 a	2.6E-01	25	b	5.3E+01 a	7.9E+03 a	1.9E-02 c	8.6E-02 e
95-63-6 1,2,4 - Trimethylbenzene	1.2E+05 a	2.3E-01 a	7.5E-02 a	2.8E-03	25	b	3.7E+03 a	2.6E-01 a	0.00E+00	1.70E-03
78-93-3 Methyl Ethyl Ketone	7.2E+04 a	1.1E-03 a	9.0E-02 a	1.2E-01	25	b	4.5E+00 a	2.7E+05 a	0.00E+00	1.43E-01
71-43-2 Benzene	7.8E+04 a	2.3E-01 a	8.8E-02 a	1.2E-01	25	b	6.2E+01 a	1.8E+03 a	1.00E-01	1.71E-02
75-15-0 Carbon disulfide	7.6E+04 a	1.2E+00 a	1.0E-01 a	4.7E-01	25	b	4.6E+01 a	1.2E+03 a	0.00E+00	2.00E-01
56-23-5 Carbon tetrachloride	1.5E+05 a	1.2E+00 a	7.8E-02 a	1.5E-01	25	b	1.5E+02 a	7.9E+02 a	1.50E-01	1.14E-02
156-59-2 cis-1,2-Dichloroethylene (cis 1,2-DCE)	9.7E+04 a	1.7E-01 a	7.4E-02 a	2.4E-04	20	b	3.6E+01 a	3.5E+03 a	0.00E+00	1.00E-02
100-41-4 Ethylbenzene	1.1E+05 a	3.2E-01 a	7.5E-02 a	1.3E-02	25	b	2.0E+02 a	1.7E+02 a	0.00E+00	5.71E-01
98-82-8 Isopropyl-benzene (cumene, 1- methyethyl benzene)	1.2E+05 a	4.9E+01 a	7.5E-02 a	5.9E-03	25	b	2.2E+02 a	6.1E+01 a	0.00E+00	1.10E-01
75-01-4 Vinyl chloride	6.3E+04 a	1.1E+00 a	1.1E-01 a	3.5E+00	25	b	1.9E+01 a	2.8E+03 a	2.70E-01	7.43E-03
1330-20-7 Xylenes	1.1E+05 a	3.0E-01 a	7.0E-02 a	1.1E-02	25	b	2.0E+02 a	1.6E+02 a	0.00E+00	2.00E-01
104-51-8 n-butylbenzene	1.3E+05 a	5.4E-01 a	7.5E-02 a	1.3E-03	23	d	2.8E+03 a	1.4E+01 a	0.00E+00	1.00E-02
135-98-8 sec-butylbenzene	1.3E+05 a	7.7E-01 a	7.5E-02 a	1.4E-03	20	d	2.2E+03 a	1.7E+01 a	0.00E+00	1.00E-02
103-65-1 n-propylbenzene	1.2E+05 b	5.4E-01 a	7.5E-02 a	1.3E-03	6.3	b	2.8E+03 a	1.4E+01 a	0.00E+00	1.00E-02
108-88-3 Toluene	9.2E+04 a	2.7E-01 a	8.7E-02 a	3.7E-02	25	b	1.4E+02 a	5.3E+02 a	0.00E+00	8.57E-02
156-60-5 trans-1,2-Dichloroethylene (trans-1,2-DCE)	9.7E+04 a	3.8E-01 a	7.1E-02 a	5.2E-01	30	b	3.8E+01 a	6.3E+03 a	0.00E+00	2.00E-02
79-01-6 Trichloroethlyene (TCE)	1.3E+05 a	4.2E-01 a	7.9E-02 a	7.6E-02	20	b	9.4E+01 a	1.1E+03 a	1.00E-02	1.71E-01
75-69-4 Trichlorofluoromethane (Freon 11)	1.4E+05 a	4.0E+00 a	8.7E-02 a	1.0E+00	25	b	1.6E+02 a	1.1E+03 a	0.00E+00	2.00E-01
108-10-1 4-Methyl-2-pentanone (MIBK)	1.0E+05 a	5.7E-03 a	7.5E-02 a	2.6E-02	25	b	1.3E+02 a	1.9E+04 a	0.00E+00	2.29E-02
108-67-8 1,3,5 - Trimethylbenzene	1.2E+05 a	3.2E-01 a	7.5E-02 a	3.3E-03	25	b	8.2E+02 a	5.0E+01 a	0.00E+00	1.70E-03
75-34-3 1,1 - Dichloroethane (1,1-DCA)	9.9E+04 a	2.3E-01 a	7.4E-02 a	3.1E-01	25	b	5.3E+01 a	5.1E+03 a	5.70E-03	1.40E-01
107-06-2 1,2-Dichloroethane (EDC)	9.9E+04 a	4.0E-02 a	1.0E-01 a	1.1E-01	25	b	3.8E+01 a	8.5E+03 a	7.00E-02	1.14E-01
75-35-4 1,1-Dichloroethylene (1,1-DCE)	9.7E+04 a	1.1E+00 a	9.0E-02 a	7.8E-01	25	b	6.5E+01 a	2.3E+03 a	1.75E-01	2.00E-02
71-55-6 1,1,1-Trichloroethane (1,1,1-TCA)	1.3E+05 a	7.1E-01 a	7.8E-02 a	1.6E-01	25	b	1.4E+02 a	1.3E+03 a	0.00E+00	2.86E-01
79-00-5 1,1,2 - TCA	1.3E+05 a	3.7E-02 a	7.8E-02 a	3.1E-02	25	b	7.5E+01 a	4.4E+03 a	5.70E-02	4.00E-03

References:

- a EPA Region 9, Preliminary Remediation Goals (PRGs), 2000.
- b U.S. National Library of Medicine Hazardous Substance Data Bank (HSDB), http://www.nlm.nih.gov/pubs/factsheets/hsdbfs.html c Cal-EPA Office of Environmental Health Hazard Assessment (OEHHA), Toxicity Criteria Database and December 2000 California Cancer Potency Values, http://www.oehha.ca.gov/risk/chemicalDB/index.asp
- d Risk Assessment Information System (RAIS) Toxicity & Chemical-Specific Factors Data Base, January 2001, http://risk.lsd.ornl.gov/cgi-bin/tox/TOX_select?select=csf
- e Cal-EPA, Air Resources Board (ARB), Consolidated Table of OEHHA/ARB Approved Risk Assessment Health Values, October 10, 2000, http://www.arb.ca.gov/ab2588/riskassess.htm

Toxicity Value reference priority:

- 1. Cal-EPA Office of Environmental Health Hazard Assessment (OEHHA), Toxicity Criteria Database and December 2000 California Cancer Potency Values, http://www.oehha.ca.gov/risk/chemicalDB/index.asp
 2. Cal-EPA, Air Resources Board (ARB), Consolidated Table of OEHHA/ARB Approved Risk Assessment Health Values, October 10, 2000, https://www.arb.ca.gov/ab2588/riskassess.htm
- 3. EPA Region 9, Preliminary Remediation Goals (PRGs), 2000.

Vapor Migration Model Result

PL-B1 Deep Soil Volatilization to Indoor Air

SUMMARY OF VAPOR MIGRATION RESULTS - COMMERCIAL/LIGHT INDUSTRIAL SCENARIO BRC Former C-6 Facility, Los Angeles, California PL-B1 Deep Soil Volatilization to Indoor Air

Soil

CAS No.	Chemical	Estimated Concentration in Soil (mg/kg)	Cancer Risk	Hazard Index
104-51-8	n-Butylbenzene	3.1	No Slope Factor	0.00084
100-41-4	Ethylbenzene	5	No Slope Factor	0.00017
103-65-1	n-Propylbenzene	2.5	No Slope Factor	0.00068
95-63-6	1,2,4-Trimethylbenzene	45	No Slope Factor	0.023
108-67-8	1,3,5-Trimethylbenzene	15	No Slope Factor	0.047
108-88-3	Toluene	0.69	No Slope Factor	0.00020
1330-20-7	Xylene	28	No Slope Factor	0.0023

Total 0.0E+00 0.075

Version: November 1999

Project Name: BRC Former Boeing C-6 Facility, Los Angeles, California

Chemical: n-butylbenzene

Variable Descriptions Units

CALCULATION OF SOIL GAS CONCENTRATION

A. SOURCE - Free Product/Soil>100mg/kg.				
Mole fraction	MF	=	0.00E+00	dimensionless
Molecular weight	MW	$\dot{x}_{ij}=\dot{y}_{ij}$	1.30E+05	mg/mole
Vapor pressure	VP	$\frac{1}{2} \cdot \frac{1}{2} = 0$	1.32E-03	atm
Universal gas constant	R	= :::	8.20E-05	atm-m3/mole-K
Temperature	T	=	2.93E+02	Κ
Calculated soil gas concentration	C _{sg} (fp)	. =	0.00E+00	mg/m3
B. SOURCE - Groundwater				
Water contamination level	C_{w}	= : :		ug/I
Henry's Law Constant	Н	= .	5.40E-01	dimensionless
Calculated soil gas concentration	C _{sg} (gw)	$\Delta u_{ij} = 0$	0.00E+00	mg/m3
C. SOURCE - Soil < 100 mg/kg				
Soil contamination level	Ct	=	3.10E+00	mg/kg
Henry's Law Constant	Н	= -	5.40E-01	dimensionless
Bulk density (dry)	ρ_{b}	=	1.50E+00	gm/cc
Air-filled porosity	θ_a	=	2.84E-01	dimensionless
Water-filled porosity	θ_{w}	=	1.50E-01	dimensionless
Weight fraction of organic carbon	f _{oc}	=	4.00E-03	dimensionless
Organic carbon partition coefficient	Koc	=	2.80E+03	cm3/gm
Soil/water distribution coef.	K_d	=	1.12E+01	cm3/gm
Calculated soil gas concentration	C _{sg} (s)	=	1.47E+02	mg/m3
D. SOURCE - Measured Soil Gas				
Measured soil gas concentration	C _{sg} (m)	=		mg/m3 (ug/l)

E. SOIL GAS CONCENTRATION USED IN RISK CALCULATIONS >>>>

1.47E+02 mg/m3

DIFFUSIVE TRANSPORT	TUP	ward in Uns	ATURATED ZONE
---------------------	-----	-------------	---------------

	m
Depth of contamination or Csg X = 6.10E+00	
Effective diffusion coefficient D _e = 6.02E-03	cm2/sec
Diffusion coefficient in air D _a = 7.50E-02	cm2/sec
Air-filled porosity $\theta_a = 2.84E-01$	dimensionless
Total porosity $\theta = 4.34E-01$	dimensionless

SITE ASSESSMEN	IT & MITIGATION	I VAPOR RISK AS	SSESSMENT MODE	L Page 2-2	<u>•</u>
Diek Calaulations				Manatani Makambila 4000	*

Risk Calculations				
CALCULATING VAPOR CONCENTRATION II	N BUILDIN	G		
A. INDOOR AIR COMPONENT		_		
Floor area of building	Α	=	9.68E+02	m2
% of floor area that flux occurs			1.00E+00	dimensionless
Attenuation factor(Crack factor)	S _b	=	1.00E-02	dimensionless
Flux area within building	Af	= :	9.68E+00	m2
Interior Height of building	R_h	=	2.44E+00	m
Volume of building	ν"	=	2.36E+03	m3
Exchange rate of air	E	= .	8.30E-01	exchanges/hr
Ventilation rate	Q	= .	1.96E+03	m3/hr
Indoor air component	C,	$\hat{x}_{i} = \hat{x}_{i}$	2.58E-04	mg/m3
B. OUTDOOR AIR COMPONENT			erit. Het transferanskappelie	
Downwind contamination length	L	=		m
Wind speed	u	$\cdot \cdot \cdot \dot{x} = \dot{x}_{1} \dot{x}_{2} \dot{x}_{3}$		m/hr
Height of building openings	h	=		m
(or height of breathing zone)				
Outdoor air component	Co	= :	0.00E+00	mg/m3
C. TOTAL INDOOR AIR CONCENTRATION	Ct	= .	2.58E-04	mg/m3
EXPOSURE SCENARIO				
Body weight	BW	= :	7.00E+01	kg
Inhalation rate	IR	= -	2.00E+01	m3/day
Exposure duration	ED	= -	2.50E+01	yrs
Hours per day	conversi	on .	8.00E+00	hr/day
Exposure time	- ET	= :	3.33E-01	hr/24 hours
Days per week	conversi	4.4 4.5 5.4	2.50E+00	days/week
Weeks per year	conversi		5.00E+01	weeks/yr
Exposure frequency	EF	= .	1.25E+02	days/yr
Averaging Time (carc. risk)	AT	=	2.56E+04	days
Averaging Time (non-carc. risk)	AT		9.13E+03	days
Chemical Intake (carc. risk)	IT _c	=	3.00E-06	mg/kg-day
Chemical Intake (non-carc. risk)	IT _{ne}	=	8.41E-06	mg/kg-day
NON-CARCINOGENIC RISK (Chronic Risk)				
Chemical Intake (non-carc. risk)	IT _{nc}	= :	8.41E-0	6 mg/kg-day
Reference dose	RfD	= .	1.00E-0	2 mg/kg-day
Hazard Index	HI	= 1.1	8.41E-0	4
CARCINOGENIC RISK				
Chemical Intake (carc. risk)	IT _c	=	3.00E-0	6 mg/kg-day
Slope factor (potency)	SF	=	0.00E+0	0 1/(mg/kg-day)
Cancer Risk	Risk	=	No Slope	, , , , , , , , , , , , , , , , , , , ,

Version: November 1999

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Project Name: BRC Former Boeing C-6 Facility, Los Angeles, California

Chemical: Ethylbenzene

Variable Descriptions Units

CALCULATION OF SOIL GAS CONCENTRATION

A. SOURCE - Free Product/Soil>100mg/kg.				
Mole fraction	MF	$a^{2}a^{2}a^{2}=a^{2}a^{2}a^{2}$	0.00E+00	dimensionless
Molecular weight	MW	$\dot{x}_{i,j} = \dot{x}_{i,j} \cdot \dot{x}_{i,j}$	1.10E+05	mg/mole
Vapor pressure	VP	r = r	1.26E-02	atm
Universal gas constant	R	= :	8.20E-05	atm-m3/mole-K
Temperature	T	= ::	2.93E+02	. K
Calculated soil gas concentration	C _{sg} (fp)	= :	0.00E+00	mg/m3
B. SOURCE - Groundwater				
Water contamination level	C _w	$\alpha_{ij} = \alpha_{ij}$		ug/l
Henry's Law Constant	Н	= :	3.20E-01	dimensionless
Calculated soil gas concentration	C _{sg} (gw)	=	0.00E+00	mg/m3
C. SOURCE - Soil < 100 mg/kg				
Soil contamination level	Ct	=	5.00E+00	mg/kg
Henry's Law Constant	Н	=	3.20E-01	dimensionless
Bulk density (dry)	ρ_{b}	=	1.50E+00	gm/cc
Air-filled porosity	θ_a	=	2.84E-01	dimensionless
Water-filled porosity	θ_{w}	=	1.50E-01	dimensionless
Weight fraction of organic carbon	f _{oc}	=	4.00E-03	dimensionless
Organic carbon partition coefficient	Koc	=	2.00E+02	cm3/gm
Soil/water distribution coef.	K _d	=	8.00E-01	cm3/gm
Calculated soil gas concentration	C _{sg} (s)	=	1.67E+03	mg/m3
D. SOURCE - Measured Soil Gas				
Measured soil gas concentration	C _{sg} (m)	=		mg/m3 (ug/l)

E. SOIL GAS CONCENTRATION USED IN RISK CALCULATIONS >>>>

1.67E+03 mg/m3

Total porosity	θ	=	4.34E-01	dimensionless
Air-filled porosity	θ_a	=	2.84E-01	dimensionless
Diffusion coefficient in air	D _a	$\frac{1}{2} = \frac{1}{2} \cdot \frac{1}$	7.50E-02	cm2/sec
Effective diffusion coefficient	D _e	= :	6.02E-03	cm2/sec
Depth of contamination or Csg	X	. =	6.10E+00	m
Calculated Flux	F _x	=	5.92E-01	mg/m2-hour

 SITE ASSESSMENT & MITIGATION VAPOR RISK ASSESSMENT MODEL	Page 2-2
 Risk Calculations	

CALCULATING VAPOR CONCENTRATION IN	BUILDING			
A. INDOOR AIR COMPONENT				
Floor area of building	Α	=	9.68E+02	m2
% of floor area that flux occurs			1.00E+00	dimensionless
Attenuation factor(Crack factor)	S_b	=	1.00E-02	dimensionless
Flux area within building	Af	=	9.68E+00	m2
Interior Height of building	R_h	=	2.44E+00	m
Volume of building	V	$= \frac{1}{2} \left(\frac{1}{2} \right) \right) \right) \right) \right)}{1} \right) \right) \right)} \right) \right)} \right)} \right)} \right)} \right)}}}}}}} \right)}}}$	2.36E+03	m3
Exchange rate of air	E	=	8.30E-01	exchanges/hr
Ventilation rate	Q	$= \frac{1}{2} \left(\frac{1}{2} \left(\frac{1}{2} \right) \right)^{\frac{1}{2}} \left(\frac{1}{2} \left(\frac{1}{2$	1.96E+03	m3/hr
Indoor air component	Ci	=	2.92E-03	mg/m3
B. OUTDOOR AIR COMPONENT				
Downwind contamination length	L	=		m
Wind speed	u	=		m/hr
Height of building openings	h	=		m
(or height of breathing zone)		tangantan Tangantan		
Outdoor air component	Co	=	0.00E+00	mg/m3
C. TOTAL INDOOR AIR CONCENTRATION	Ct	=	2.92E-03	mg/m3
EXPOSURE SCENARIO				
Body weight	BW	=	7.00E+01	kg
Inhalation rate	IR	= 1 1 1 1 1	2.00E+01	m3/day
Exposure duration	ED	= 1	2.50E+01	yrs
Hours per day	conversion	er a fill of the	8.00E+00	hr/day
Exposure time	ET	=	3.33E-01	hr/24 hours
Days per week	conversion		2.50E+00	days/week
Weeks per year	conversion		5.00E+01	weeks/yr
Exposure frequency	EF ^T	=	1.25E+02	days/yr
Averaging Time (carc. risk)	AT AT	=	2.56E+04	days
Averaging Time (non-carc. risk)	AI	_	9.13E+03	days
Chemical Intake (carc. risk)	IT _c	=	3.40E-05	mg/kg-day
Chemical Intake (non-carc. risk)	IT _{nc}	=	9.54E-05	mg/kg-day
NON-CARCINOGENIC RISK (Chronic Risk)				
Chemical Intake (non-carc. risk)	IT _{nc}	=		mg/kg-day
Reference dose	RfD	=		mg/kg-day
Hazard Index	HI	=	1.67E-04	
CARCINOGENIC RISK				
Chemical Intake (carc. risk)	IT _c	$= 0.016 \times 10^{-10}$	3.40E-05	mg/kg-day
Slope factor (potency)	SF	=	0.00E+00	1/(mg/kg-day)
Cancer Risk	Risk	=	No Slope F	actor
		tiga estat je	ty and the	

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Version: November 1999

Project Name: BRC Former Boeing C-6 Facility, Los Angeles, California

Chemical: n-propylbenzene

Variable Descriptions Units

CALCULATION OF SOIL GAS CONCENTRATION

A. SOURCE - Free Product/Soil>100mg/kg.				
Mole fraction	MF	=	0.00E+00	dimensionless
Molecular weight	MW	= :	1.20E+05	mg/mole
Vapor pressure	VP	$\frac{1}{2} = \frac{1}{2} \cdot \frac{1}{2}$	1.32E-03	atm
Universal gas constant	R	=	8.20E-05	atm-m3/mole-K
Temperature	T	=	2.93E+02	K
Calculated soil gas concentration	C _{sg} (fp)	_ =	0.00E+00	mg/m3
B. SOURCE - Groundwater				
Water contamination level	C _w	$\dot{x}=\dot{x}$		ug/l
Henry's Law Constant	Н	= .	5.40E-01	dimensionless
Calculated soil gas concentration	C _{sg} (gw)	= .	0.00E+00	mg/m3
C. SOURCE - Soil < 100 mg/kg				
Soil contamination level	Ct	= ::	2.50E+00	mg/kg
Henry's Law Constant	Н	= -	5.40E-01	dimensionless
Bulk density (dry)	ρ_{b}	= :	1.50E+00	gm/cc
Air-filled porosity	θ_a	= .	2.84E-01	dimensionless
Water-filled porosity	$\theta_{\rm w}$	=	1.50E-01	dimensionless
Weight fraction of organic carbon	f _{oc}	=	4.00E-03	dimensionless
Organic carbon partition coefficient	K _{oc}	= 11	2.80E+03	cm3/gm
Soil/water distribution coef.	K_{d}		1.12E+01	cm3/gm
Calculated soil gas concentration	C _{sg} (s)	= ::	1.18E+02	mg/m3
D. SOURCE - Measured Soil Gas				
Measured soil gas concentration	C _{sg} (m)	= : ::		mg/m3 (ug/l)

E. SOIL GAS CONCENTRATION USED IN RISK CALCULATIONS >>>>

1.18E+02 mg/m3

Total porosity	θ	_ =	4.34E-01	dimensionless
Air-filled porosity	θ_a	=	2.84E-01	dimensionless
Diffusion coefficient in air	D _a	=	7.50E-02	cm2/sec
Effective diffusion coefficient	De	= :	6.02E-03	cm2/sec
Depth of contamination or Csg	X	$A^{\alpha}=A^{\alpha}A^{\alpha}A^{\alpha}A^{\alpha}A^{\alpha}A^{\alpha}A^{\alpha}A^{\alpha}$	6.10E+00	m
Calculated Flux	F _x	=	4.21E-02	mg/m2-hour

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Version: November 1999

· A	<u> </u>	9.68E+02	m2
		1.00E+00	dimensionless
S_b	=	1.00E-02	dimensionless
Af	=	9.68E+00	m2
R_h	=	2.44E+00	m
Λ	=	2.36E+03	m3
E	=	8.30E-01	exchanges/hr
Q	=	1.96E+03	m3/hr
Ci	=	2.08E-04	mg/m3
L	=		m
u	$\dot{x}=\dot{x}^{-1} + \dot{x}^{-1} + \dot{x}^{-1}$		m/hr
h	=		m
Co	=	0.00E+00	mg/m3
· C		2 08E-04	mg/m3
Ŭ ŧ		2.00L-04	mg/m3
		2.00L-04	9 , >
BW		7.00E+01	kg
		7.00E+01 2.00E+01	
BW	100	7.00E+01	kg m3/day yrs
BW IR ED conversion	= 1 1 1 1	7.00E+01 2.00E+01 2.50E+01 8.00E+00	kg m3/day yrs hr/day
BW IR ED conversion ET	= :	7.00E+01 2.00E+01 2.50E+01 8.00E+00 3.33E-01	kg m3/day yrs hr/day hr/24 hours
BW IR ED conversion ET conversion		7.00E+01 2.00E+01 2.50E+01 8.00E+00 3.33E-01 2.50E+00	kg m3/day yrs hr/day hr/24 hours days/week
BW IR ED conversion ET conversion conversion		7.00E+01 2.00E+01 2.50E+01 8.00E+00 3.33E-01 2.50E+00 5.00E+01	kg m3/day yrs hr/day hr/24 hours days/week weeks/yr
BW IR ED conversion ET conversion conversion		7.00E+01 2.00E+01 2.50E+01 8.00E+00 3.33E-01 2.50E+00 5.00E+01 1.25E+02	kg m3/day yrs hr/day hr/24 hours days/week weeks/yr days/yr
BW IR ED conversion ET conversion conversion		7.00E+01 2.00E+01 2.50E+01 8.00E+00 3.33E-01 2.50E+00 5.00E+01	kg m3/day yrs hr/day hr/24 hours days/week weeks/yr
	Af Rh V E Q Ci L u h	A = S _b = Af = R _n = V = E = Q = C _i = L = u = h = C _o =	A = 9.68E+02 1.00E+00 S _b = 1.00E-02 Af = 9.68E+00 R _h = 2.44E+00 V = 2.36E+03 E = 8.30E-01 Q = 1.96E+03 C _i = 2.08E-04 L = u = h = 1

	RISK (Chronic I	

Chemical Intake (carc. risk)

Chemical Intake (non-carc. risk)

Chemical Intake (non-car	c. risk)	IT _{nc}	= 6.78E-06	mg/kg-day
Reference dose		RfD	= 1.00E-02	2 mg/kg-day
Hazard Index		HI	= 6.78E - 04	

ITc

IT_{nc}

2.42E-06

6.78E-06

mg/kg-day

mg/kg-day

CARCINOGENIC RISK

Chemical Intake (carc. risk) $IT_c = 2.42E-06 \text{ mg/kg-c}$	lay
Slope factor (potency) SF = 0.00E+00 1/(mg/k	g-day)
Cancer Risk = No Slope Factor	

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Version: November 1999

Project Name: BRC Former Boeing C-6 Facility, Los Angeles, California

Chemical: 1,2,4 - Trimethylbenzene

Measured soil gas concentration

Variable Descriptions				Units
CALCULATION OF SOIL GAS CONCENTRA	TION			
A. SOURCE - Free Product/Soil>100mg/kg.				
Mole fraction	MF	=	0.00E+00	dimensionless
Molecular weight	MW	:	1.20E+05	mg/mole
Vapor pressure	VP	= :	2.76E-03	atm
Universal gas constant	R	$\frac{1}{2} = \frac{1}{2} \cdot \frac{1}{2}$	8.20E-05	atm-m3/mole-K
Temperature	T	=	2.93E+02	K
Calculated soil gas concentration	C _{sg} (fp)	= :	0.00E+00	mg/m3
B. SOURCE - Groundwater				
Water contamination level	C _w	= :		ug/l
Henry's Law Constant	Н	= :	2.30E-01	dimensionless
Calculated soil gas concentration	C _{sq} (gw)	= :	0.00E+00	mg/m3
C. SOURCE - Soil < 100 mg/kg				
Soil contamination level	Ct	$\dot{a} = \dot{a}$	4.50E+01	mg/kg
Henry's Law Constant	Н	=	2.30E-01	dimensionless
Bulk density (dry)	ρ_b	=	1.50E+00	gm/cc
Air-filled porosity	θ_a	=	2.84E-01	dimensionless
Water-filled porosity	θ_{w}	$\dot{x}_{ij} = \dot{x}_{ij}$	1.50E-01	dimensionless
Weight fraction of organic carbon	f _{oc}	=	4.00E-03	dimensionless
Organic carbon partition coefficient	K _{oc}	= .	3.70E+03	cm3/gm
Soil/water distribution coef.	K _d	=	1.48E+01	cm3/gm
Calculated soil gas concentration	C _{sg} (s)	=	6.93E+02	mg/m3
D. SOURCE - Measured Soil Gas				

E. SOIL GAS CONCENTRATION USED IN RISK CALCULATIONS >>>>

6.93E+02 mg/m3

mg/m3 (ug/l)

DIFFUSIVE TRANSPORT UPWARD IN UN	SATURATE	ED ZONE		
Total porosity	θ	=	4.34E-01	dimensionless
Air-filled porosity	θ_a	=	2.84E-01	dimensionless
Diffusion coefficient in air	D _a	=	7.50E-02	cm2/sec
Effective diffusion coefficient	D _e	= :::	6.02E-03	cm2/sec
Depth of contamination or Csg	X	= :::::	6.10E+00	m
Calculated Flux	F _x	=	2.46E-01	mg/m2-hour

C_{sq}(m)

SITE ASSESSMENT & MITIGATION VAP Risk Calculations	OR RISK ASSE	ESSMENT MO	ODEL
CALCULATING VAPOR CONCENTRATION II	N BUILDING		
A. INDOOR AIR COMPONENT			
Floor area of building	A =	9.68E+02	m2
% of floor area that flux occurs		1.00E+00	dimensionless
Attenuation factor(Crack factor)	$S_b = S_b = S_b$	1.00E-02	dimensionless
Flux area within building	Af = :	9.68E+00	m2
Interior Height of building	- R _h = -	2.44E+00	m
Volume of building	Ψ	2.36E+03	m3
Exchange rate of air	E = .	8.30E-01	exchanges/hr
Ventilation rate	Q = =	1.96E+03	m3/hr
Indoor air component	C ; =	1.22E-03	mg/m3
B. OUTDOOR AIR COMPONENT			
Downwind contamination length	L		m
Wind speed	u =		m/hr
Height of building openings	h = :		m
(or height of breathing zone)			
Outdoor air component	C _o =	0.00E+00	mg/m3
C. TOTAL INDOOR AIR CONCENTRATION	C _t =	1.22E-03	mg/m3
EXPOSURE SCENARIO			
Body weight	BW =	7.00E+01	kg
Inhalation rate	IR =	2.00E+01	m3/day
Exposure duration	ED =	2.50E+01	yrs
Hours per day	conversion	8.00E+00	hr/dav

~ ~	4.005.00	g/o
=	1.22E-03	mg/m3
BW =	7.00E+01	kg
IR =	2.00E+01	m3/day
ED =	2.50E+01	yrs
conversion	8.00E+00	hr/day
: ET	3.33E-01	hr/24 hours
conversion	2.50E+00	days/week
conversion	5.00E+01	weeks/yr
EF =	1.25E+02	days/yr
	2.56E+04	days
AT=	9.13E+03	days
IT _c =	1.41E-05	mg/kg-day
IT _{nc} =	3.97E-05	mg/kg-day
IT _{nc} =	3.97E-0	5 mg/kg-day
RfD =	1.70E-0	3 mg/kg-day
HI =	2.33E-0	2
i r -	1.41E 0	5 malka day
	A Company of the Comp	0 1/(mg/kg-day)
KISK =	NO SIODE	ractor
	IR	BW = 7.00E+01 IR = 2.00E+01 ED = 2.50E+01 conversion 8.00E+00 ET = 3.33E-01 conversion 2.50E+00 conversion 5.00E+01 EF = 1.25E+02 AT = 2.56E+04 AT = 9.13E+03 IT _c = 1.41E-05 IT _{nc} = 3.97E-05 IT _{nc} = 3.97E-0 HI = 2.33E-0 IT _c = 1.41E-0

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Version: November 1999

Project Name: BRC Former Boeing C-6 Facility, Los Angeles, California

Chemical: 1,3,5 - Trimethylbenzene

Variable Descriptions Units

CALCULATION OF SOIL GAS CONCENTRATION

A. SOURCE - Free Product/Soil>100mg/kg.				
Mole fraction	MF	$\boldsymbol{x}_{i}=\boldsymbol{x}_{i}$	0.00E+00	dimensionless
Molecular weight	MW	= -	1.20E+05	mg/mole
Vapor pressure	VP	- =	3.26E-03	atm
Universal gas constant	R	=	8.20E-05	atm-m3/mole-K
Temperature	T	=	2.93E+02	K
Calculated soil gas concentration	C _{sg} (fp)	=	0.00E+00	mg/m3
B. SOURCE - Groundwater				
Water contamination level	C _w			ug/l
Henry's Law Constant	Н	*	3.20E-01	dimensionless
Calculated soil gas concentration	$C_{sg}(gw)$	=	0.00E+00	mg/m3
C. SOURCE - Soil < 100 mg/kg				
Soil contamination level	Ct	=	1.50E+01	mg/kg
Henry's Law Constant	Н	=	3.20E-01	dimensionless
Bulk density (dry)	ρ_{b}	=	1.50E+00	gm/cc
Air-filled porosity	θ_a	=	2.84E-01	dimensionless
Water-filled porosity	θ_{w}		1.50E-01	dimensionless
Weight fraction of organic carbon	f _{oc}	= 1	4.00E-03	dimensionless
Organic carbon partition coefficient	Koc	=	8.20E+02	cm3/gm
Soil/water distribution coef.	K_d	=	3.28E+00	cm3/gm
Calculated soil gas concentration	C _{sg} (s)	=	1.40E+03	mg/m3
D. SOURCE - Measured Soil Gas				
Measured soil gas concentration	C _{sg} (m)	=		mg/m3 (ug/l)

E. SOIL GAS CONCENTRATION USED IN RISK CALCULATIONS >>>>

1.40E+03 mg/m3

Ŀ	<u>DIFFUSIVE TRANSPORT UPWARD</u>	<u>IN UNSATURATED ZONI</u>	Ε	
Ċ.	Total porosity	θ =	4.34E-01	dimensionless
	Air-filled porosity	θ_a	2.84E-01	dimensionless
	Diffusion coefficient in air	D_a	7.50E-02	cm2/sec
Ċ,	Effective diffusion coefficient	D _e =	6.02E-03	cm2/sec

Depth of contamination or Csg X = 6.10E+00 mCalculated Flux $F_x = 4.96E-01 \text{ mg/m2-hour}$

SITE ASSESSM	ENT & MITIGATION	VAPOR RISK ASSESS	MENT MODEL	Page 2-2
Risk Calculations				Version: November 1999

CALCULATING VAPOR CONCENTRATION IN	BUILDING			
A. INDOOR AIR COMPONENT				
Floor area of building	Α	`= `	9.68E+02	m2
% of floor area that flux occurs			1.00E+00	dimensionless
Attenuation factor(Crack factor)	S_b	=	1.00E-02	dimensionless
Flux area within building	Af	=::::::::::::::::::::::::::::::::::::::	9.68E+00	m2
Interior Height of building	R _h	=	2.44E+00	m
Volume of building	Λ	$= \frac{1}{2} \left(\frac{1}{2} \left(\frac{1}{2} \right) \right)$	2.36E+03	m3
Exchange rate of air	E	=	8.30E-01	exchanges/hr
Ventilation rate	Q	=: : : : : :	1.96E+03	m3/hr
Indoor air component	Ci	=::::::::::::::::::::::::::::::::::::::	2.45E-03	mg/m3
B. OUTDOOR AIR COMPONENT				
Downwind contamination length	L	=		m
Wind speed	u	=		m/hr
Height of building openings	h	=		m
(or height of breathing zone)				
Outdoor air component	Co	=	0.00E+00	mg/m3
C. TOTAL INDOOR AIR CONCENTRATION	Ct	=	2.45E-03	mg/m3
EXPOSURE SCENARIO				
Body weight	BW	=	7.00E+01	kg
Inhalation rate	IR .	=	2.00E+01	m3/day
Exposure duration	ED	=	2.50E+01	yrs
Hours per day	conversion		8.00E+00	hr/day
Exposure time	ET	=	3.33E-01	hr/24 hours
Days per week	conversion	100000	2.50E+00	days/week
Weeks per year	conversion	100	5.00E+01	weeks/yr
Exposure frequency	EF	=	1.25E+02	days/yr
Averaging Time (carc. risk)	AT	=	2.56E+04	days
Averaging Time (non-carc. risk)	AT	=	9.13E+03	days
Chemical Intake (carc. risk)	IT _c		2.85E-05	mg/kg-day
Chemical Intake (non-carc, risk)	IT _{nc}	=	7.99E-05	mg/kg-day
NON-CARCINOGENIC RISK (Chronic Risk)				
Chemical Intake (non-carc. risk)	IT _{nc}	=""":		mg/kg-day
Reference dose	RfD	=	1.70E-03	mg/kg-day
Hazard Index	HI	=	4.70E-02	
CARCINOGENIC RISK				
Chemical Intake (carc. risk)	IT _c	=	2 85F-05	mg/kg-day
Slope factor (potency)	SF			1/(mg/kg-day)
Cancer Risk	Risk		No Slope F	
Odlice Nisk	IZION	_	Mo Slope r	actor

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Version: November 1999

Project Name: BRC Former Boeing C-6 Facility, Los Angeles, California

Chemical: Toluene

Weight fraction of organic carbon

Soil/water distribution coef.

D. SOURCE - Measured Soil Gas

Organic carbon partition coefficient

Calculated soil gas concentration

Measured soil gas concentration

Variable Descriptions Units **CALCULATION OF SOIL GAS CONCENTRATION** A. SOURCE - Free Product/Soil>100mg/kg. MF 0.00E+00 Mole fraction dimensionless Molecular weight MW 9.20E+04 ma/mole VP. Vapor pressure 3.74E-02 atm Universal gas constant R 8.20E-05 atm-m3/mole-K Temperature 2.93E+02 K C_{sg}(fp) Calculated soil gas concentration 0.00E+00 mg/m3 B. SOURCE - Groundwater $C_{\rm w}$ Water contamination level ug/l = 2.70E-01 dimensionless Henry's Law Constant H =Calculated soil gas concentration $C_{sg}(gw)$ 0.00E+00 mg/m3 C. SOURCE - Soil < 100 mg/kg C_{t} = 6.90E-01 Soil contamination level mg/kg Henry's Law Constant Н 2.70E-01 = dimensionless 1.50E+00 Bulk density (dry) ρ_b gm/cc Air-filled porosity 2.84E-01 θ_a =dimensionless $\boldsymbol{\theta}_{w}$ Water-filled porosity 1.50E-01 dimensionless

 f_{oc}

K_{oc}

 K_{d}

C_{sg}(s)

C_{sq}(m)

E. SOIL GAS CONCENTRATION USED IN RISK CALCULATIONS >>>>

2.62E+02 mg/m3

dimensionless

mg/m3 (ug/l)

cm3/gm

cm3/gm

mg/m3

4.00E-03

1.40E+02

5.60E-01

2.62E+02

 $\stackrel{.}{=}$

<u>DIFFUSIVE TRANSPORT UPWARD IN UNSA</u>	<u>\TURAT</u>	ED ZONE			.]
Total porosity	θ	=	4.34E-01	dimensionless	1.
Air-filled porosity	θ_a	$\frac{1}{2} = \frac{1}{2} \left(\frac{1}{2} \right)^{\frac{1}{2}}$	2.84E-01	dimensionless	٠.
Diffusion coefficient in air	D _a	≐	8.70E-02	cm2/sec	
Effective diffusion coefficient	De	=	6.98E-03	cm2/sec	
Depth of contamination or Csg	X		6.10E+00	m	
Calculated Flux	· · · F.: · · ·		1.08F-01	ma/m2-hour	

SITE ASSESSMENT & MITIGATION VAPOR RISK ASSESSMENT MODEL Page 2-2 Risk Calculations Version: November 1999

CALCULATING VAPOR CONCENTRATION IN	BUILDING			
A. INDOOR AIR COMPONENT				
Floor area of building	Α	=======================================	9.68E+02	m2
% of floor area that flux occurs			1.00E+00	dimensionless
Attenuation factor(Crack factor)	Sb	=	1.00E-02	dimensionless
Flux area within building	Af	=	9.68E+00	m2
Interior Height of building	R_h	=	2.44E+00	m
Volume of building	V	$= \frac{1}{2} \left(\frac{1}{2} \cdot \frac$	2.36E+03	m3
Exchange rate of air	E	= 1, 1, 1	8.30E-01	exchanges/hr
Ventilation rate	Q	=::::::::::::::::::::::::::::::::::::::	1.96E+03	m3/hr
Indoor air component	Ci	=0.001	5.34E-04	mg/m3
B. OUTDOOR AIR COMPONENT				
Downwind contamination length	L	=		m
Wind speed	u	=		m/hr
Height of building openings	h	=		m
(or height of breathing zone)				
Outdoor air component	Co	=::::::::::::::::::::::::::::::::::::::	0.00E+00	mg/m3
C. TOTAL INDOOR AIR CONCENTRATION	Ct	=	5.34E-04	mg/m3
Source As a local fractional in its Board Source, Source from P. in 1997, Board in Novel				
EXPOSURE SCENARIO	DIA		7.00E+04	neze
Body weight Inhalation rate	BW IR		7.00E+01 2.00E+01	kg m3/day
Exposure duration	ED	=	2.50E+01	yrs:
Hours per day	conversion	100	8.00E+00	hr/day
Exposure time	FT	=	3.33E-01	hr/24 hours
Days per week	conversion		2.50E+00	days/week
Weeks per year	conversion	4.00	5.00E+01	weeks/yr
Exposure frequency	EF	=	1.25E+02	days/yr
Averaging Time (carc. risk)	AT	=	2.56E+04	days
Averaging Time (non-carc. risk)	AT	=	9.13E+03	days
Chemical Intake (carc. risk)	IT _c	=	6.20E-06	mg/kg-day
Chemical Intake (non-carc. risk)	IT _{nc}	=	1.74E-05	mg/kg-day
NON-CARCINOGENIC RISK (Chronic Risk)	ere a de la composition della		4 745 65	en e
Chemical Intake (non-carc. risk)	IT _{nc}	=	4 1 1	mg/kg-day
Reference dose	RfD			mg/kg-day
Hazard Index	HI		2.03E-04	
CARCINOGENIC RISK				
Chemical Intake (carc. risk)	$IT_{\mathbf{c}}$	=	6.20F-06	mg/kg-day
Slope factor (potency)	SF	=	1.7	1/(mg/kg-day)
Cancer Risk	Risk	<u> </u>	No Slope I	, , , , , , , , , , , , , , , , , , , ,
			Jiopo i	

SITE ASSESSMENT & MITIGATION VAPOR RISK ASSESSMENT MODEL Page 1-2 Risk Calculations Version: November 1999

Project Name: BRC Former Boeing C-6 Facility, Los Angeles, California

Chemical: Xylenes

Variable Descriptions Units

CALCULATION OF SOIL GAS CONCENTRATION

A. SOURCE - Free Product/Soil>100mg/kg.				
Mole fraction	MF	- =	0.00E+00	dimensionless
Molecular weight	MW	=	1.10E+05	mg/mole
Vapor pressure	VP	= :	1.05E-02	atm
Universal gas constant	R	$\Delta u = u_1 u_2^{-1}$	8.20E-05	atm-m3/mole-K
Temperature	T	=	2.93E+02	: K
Calculated soil gas concentration	C _{sg} (fp)	= :	0.00E+00	mg/m3
B. SOURCE - Groundwater				
Water contamination level	C_{w}	= :		ug/l
Henry's Law Constant	H	= :	3.00E-01	dimensionless
Calculated soil gas concentration	C _{sg} (gw)	=	0.00E+00	mg/m3
C. SOURCE - Soil < 100 mg/kg				
Soil contamination level	Ct	=	2.80E+01	mg/kg
Henry's Law Constant	Н	= .	3.00E-01	dimensionless
Bulk density (dry)	ρ_b	=	1.50E+00	gm/cc
Air-filled porosity	θ_a	$\Delta \Delta \Delta = \Delta \Delta \Delta \Delta$	2.84E-01	dimensionless
Water-filled porosity	θ_{w}	=	1.50E-01	dimensionless
Weight fraction of organic carbon	f _{oc}	=	4.00E-03	dimensionless
Organic carbon partition coefficient	K _{oc}	=	2.00E+02	cm3/gm
Soil/water distribution coef.	K _d	= :	8.00E-01	cm3/gm
Calculated soil gas concentration	C _{sg} (s)	=	8.78E+03	mg/m3
D. SOURCE - Measured Soil Gas				
Measured soil gas concentration	C _{sg} (m)	=		mg/m3 (ug/l)

E. SOIL GAS CONCENTRATION USED IN RISK CALCULATIONS >>>>

8.78E+03 mg/m3

DI	FF	USI	VΕ	Т	R	٩٨	ISI	P	OR	T	U	P	V	ĮΔ	R	D	IN	l	J١	٧S	ΑT	U	R	Δ٦	ΓΕ	D	Z	O١	lΕ	Ü

Total porosity	θ		4.34E-01	dimensionless
Air-filled porosity	θ_a		2.84E-01	dimensionless
Diffusion coefficient in air	D _a	=	7.00E-02	cm2/sec
Effective diffusion coefficient	D _e	= :::	5.62E-03	cm2/sec
Depth of contamination or Csg	Χ	= ::	6.10E+00	m
Calculated Flux	F _x		2.91E+00	mg/m2-hour

SITE ASSESSMENT	8 MITIGATION	VAPOR RISK ASSESSMENT MC)DEL
Company and the company of the compa			

Risk Calculations Version: November 1999

CALCULATING VAPOR CONCENTRATION IN	BUILDING	`		
A. INDOOR AIR COMPONENT	Α	- 1	0.005.00	
Floor area of building	Α	. =	9.68E+02	m2
% of floor area that flux occurs	C		1.00E+00	dimensionless
Attenuation factor(Crack factor)	Sb	= 1	1.00E-02	dimensionless
Flux area within building	Af	=	9.68E+00	m2
Interior Height of building	R _h	=	2.44E+00	m
Volume of building	V	=	2.36E+03	m3
Exchange rate of air	E	=	8.30E-01	exchanges/hr
Ventilation rate	Q	=	1.96E+03	m3/hr
Indoor air component	Ci	=	1.44E-02	mg/m3
B. OUTDOOR AIR COMPONENT				
Downwind contamination length	L	=		m
Wind speed	u L			m/hr
Height of building openings	h	`=		m
(or height of breathing zone)	^		0.005.00	
Outdoor air component	Co	=	0.00E+00	mg/m3
C. TOTAL INDOOR AIR CONCENTRATION	Ct	=	1.44E-02	mg/m3
EXPOSURE SCENARIO				
Body weight	BW	=	7.00E+01	kg
Inhalation rate	IR	=	2.00E+01	m3/day
Exposure duration	ED	=	2.50E+01	yrs
Hours per day	conversion		8.00E+00	hr/day
Exposure time	ET	=	3.33E-01	hr/24 hours
Days per week	conversion	1000	2.50E+00	days/week
Weeks per year	conversion	and the figure	5.00E+01	weeks/yr
Exposure frequency	EF	=	1.25E+02	days/yr
Averaging Time (carc. risk)	AT	=	2.56E+04	days
Averaging Time (non-carc. risk)	AT	=	9.13E+03	days
Chemical Intake (carc. risk)	IT _c	=	1.67E-04	mg/kg-day
Chemical Intake (non-carc. risk)	IT _{ne}	=	4.69E-04	mg/kg-day
NON-CARCINOGENIC RISK (Chronic Risk)				
Chemical Intake (non-carc. risk)	IT _{nc}	=	4.69E-04	mg/kg-day
Reference dose	RfD	=:	The second secon	mg/kg-day
Hazard Index	HI	=	2.35E-03	
CARCINOGENIC RISK				
Chemical Intake (carc. risk)	IT _c	_	1.67F-04	mg/kg-day
Slope factor (potency)	SF			1/(mg/kg-day)
Cancer Risk	Risk		No Slope I	
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CHEMICAL PARAMETERS

			_					Water	T	Chronic RfD
	MW	H'	Da	VP	Temp.		K _{oc}	Solubility	CSF (inh)	(inh)
	(mg/mole)	(dimension- less)	(cm²/sec)	(atm)	(°C)		(cm³/g)	(mg/L-water)	(mg/kg-day) ⁻¹	(mg/kg-day)
CAS No.										
127-18-4 Tetrachloroethylene (PCE)	1.7E+05 a	7.5E-01 a	7.2E-02 a	2.4E-02	25	ь	2.7E+02 a	2.0E+02 a	2.1E-02 c	1.0E-02 e
75-09-2 Methylene Chloride	8.5E+04 a	9.0E-02 a	1.0E-01 a	5.7E-01	25	b	1.0E+01 a	1.3E+04 a	3.5E-03 c	1.1E-01 e
67-66-3 Chloroform	1.2E+05 a	1.5E-01 a	1.0E-01 a	2.6E-01	25	b	5.3E+01 a	7.9E+03 a	1.9E-02 c	8.6E-02 e
95-63-6 1,2,4 - Trimethylbenzene	1.2E+05 a	2.3E-01 a	7.5E-02 a	2.8E-03	25	b	3.7E+03 a	2.6E-01 a	0.00E+00	1.70E-03
78-93-3 Methyl Ethyl Ketone	7.2E+04 a	1.1E-03 a	9.0E-02 a	1.2E-01	25	b	4.5E+00 a	2.7E+05 a	0.00E+00	1.43E-01
71-43-2 Benzene	7.8E+04 a	2.3E-01 a	8.8E-02 a	1.2E-01	25	b	6.2E+01 a	1.8E+03 a	1.00E-01	1.71E-02
75-15-0 Carbon disulfide	7.6E+04 a	1.2E+00 a	1.0E-01 a	4.7E-01	25	b	4.6E+01 a	1.2E+03 a	0.00E+00	2.00E-01
56-23-5 Carbon tetrachloride	1.5E+05 a	1.2E+00 a	7.8E-02 a	1.5E-01	25	b	1.5E+02 a	7.9E+02 a	1.50E-01	1.14E-02
156-59-2 cis-1,2-Dichloroethylene (cis 1,2-DCE)	9.7E+04 a	1.7E-01 a	7.4E-02 a	2.4E-04	20	b	3.6E+01 a	3.5E+03 a	0.00E+00	1.00E-02
100-41-4 Ethylbenzene	1.1E+05 a	3.2E-01 a	7.5E-02 a	1.3E-02	25	b	2.0E+02 a	1.7E+02 a	0.00E+00	5.71E-01
98-82-8 Isopropyl-benzene (cumene, 1- methyethyl benzene)	1.2E+05 a	4.9E+01 a	7.5E-02 a	5.9E-03	25	b	2.2E+02 a	6.1E+01 a	0.00E+00	1.10E-01
75-01-4 Vinyl chloride	6.3E+04 a	1.1E+00 a	1.1E-01 a	3.5E+00	25	b	1.9E+01 a	2.8E+03 a	2.70E-01	7.43E-03
1330-20-7 Xylenes	1.1E+05 a	3.0E-01 a	7.0E-02 a	1.1E-02	25	b	2.0E+02 a	1.6E+02 a	0.00E+00	2.00E-01
104-51-8 n-butylbenzene	1.3E+05 a	5.4E-01 a	7.5E-02 a	1.3E-03	23	d	2.8E+03 a	1.4E+01 a	0.00E+00	1.00E-02
135-98-8 sec-butylbenzene	1.3E+05 a	7.7E-01 a	7.5E-02 a	1.4E-03	20	d	2.2E+03 a	1.7E+01 a	0.00E+00	1.00E-02
103-65-1 n-propylbenzene	1.2E+05 b	5.4E-01 a	7.5E-02 a	1.3E-03	6.3	b	2.8E+03 a	1.4E+01 a	0.00E+00	1.00E-02
108-88-3 Toluene	9.2E+04 a	2.7E-01 a	8.7E-02 a	3.7E-02	25	b	1.4E+02 a	5.3E+02 a	0.00E+00	8.57E-02
156-60-5 trans-1,2-Dichloroethylene (trans-1,2-DCE)	9.7E+04 a	3.8E-01 a	7.1E-02 a	5.2E-01	30	b	3.8E+01 a	6.3E+03 a	0.00E+00	2.00E-02
79-01-6 Trichloroethlyene (TCE)	1.3E+05 a	4.2E-01 a	7.9E-02 a	7.6E-02	20	b	9.4E+01 a	1.1E+03 a	1.00E-02	1.71E-01
75-69-4 Trichlorofluoromethane (Freon 11)	1.4E+05 a	4.0E+00 a	8.7E-02 a	1.0E+00	25	b	1.6E+02 a	1.1E+03 a	0.00E+00	2.00E-01
108-10-1 4-Methyl-2-pentanone (MIBK)	1.0E+05 a	5.7E-03 a	7.5E-02 a	2.6E-02	25	b	1.3E+02 a	1.9E+04 a	0.00E+00	2.29E-02
108-67-8 1,3,5 - Trimethylbenzene	1.2E+05 a	3.2E-01 a	7.5E-02 a	3.3E-03	25	b	8.2E+02 a	5.0E+01 a	0.00E+00	1.70E-03
75-34-3 1,1 - Dichloroethane (1,1-DCA)	9.9E+04 a	2.3E-01 a	7.4E-02 a	3.1E-01	25	b	5.3E+01 a	5.1E+03 a	5.70E-03	1.40E-01
107-06-2 1,2-Dichloroethane (EDC)	9.9E+04 a	4.0E-02 a	1.0E-01 a	1.1E-01	25	b	3.8E+01 a	8.5E+03 a	7.00E-02	1.14E-01
75-35-4 1,1-Dichloroethylene (1,1-DCE)	9.7E+04 a	1.1E+00 a	9.0E-02 a	7.8E-01	25	b	6.5E+01 a	2.3E+03 a	1.75E-01	2.00E-02
71-55-6 1,1,1-Trichloroethane (1,1,1-TCA)	1.3E+05 a	7.1E-01 a	7.8E-02 a	1.6E-01	25	b	1.4E+02 a	1.3E+03 a	0.00E+00	2.86E-01
79-00-5 1,1,2 - TCA	1.3E+05 a	3.7E-02 a	7.8E-02 a	3.1E-02	25	b	7.5E+01 a	4.4E+03 a	5.70E-02	4.00E-03

References:

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- d Risk Assessment Information System (RAIS) Toxicity & Chemical-Specific Factors Data Base, January 2001, http://risk.lsd.ornl.gov/cgi-bin/tox/TOX_select?select=csf
- e Cal-EPA, Air Resources Board (ARB), Consolidated Table of OEHHA/ARB Approved Risk Assessment Health Values, October 10, 2000, http://www.arb.ca.gov/ab2588/riskassess.htm

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- 1. Cal-EPA Office of Environmental Health Hazard Assessment (OEHHA), Toxicity Criteria Database and December 2000 California Cancer Potency Values, http://www.oehha.ca.gov/risk/chemicalDB/index.asp
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